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Dental Digest

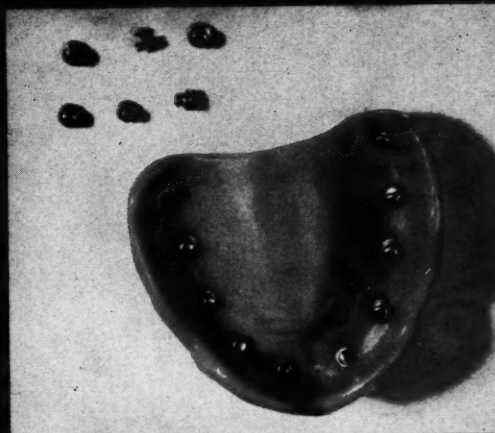
July 1953

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article, page 298



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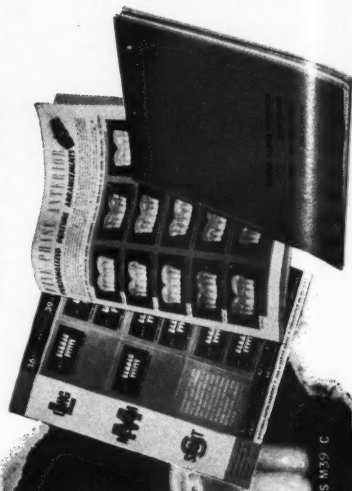
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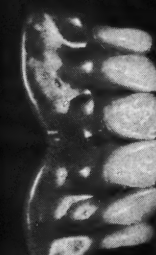
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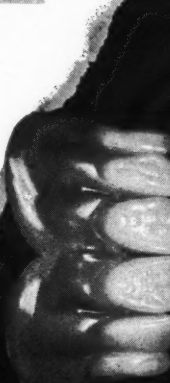
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HARMON SHOHEI, D.M.D. (Harvard University Dental School, 1918) presents the second installment of his two-part article, FUNDAMENTALS IN MOUTH RECONSTRUCTION AND THE TEMPOROMANDIBULAR JOINT SYNDROME.

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An INPLANT BUTTON Technique for Denture Prosthesis

ISAIH LEW, D.D.S.,
and IRVING KESTENBAUM, D.D.S., New York

DIGEST

This article reports a technique devised to improve retention of tissue-bearing denture bases. Unlike the implant denture technique, metal is not inserted into the mucoperiosteum. The history of a case recently completed and detailed directions for execution of the operative procedure employed are presented.

Preliminary Report

The technique executed was suggested by Hans Nordgren of Sweden and originally developed by Gustav Dahl

about 1940. Nordgren reports 30 cases successfully functioning for periods ranging up to 10 years.

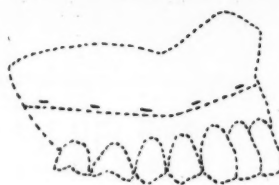
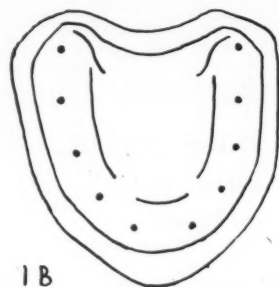
Principles

The principle of implant (not implant) is based on the histopathologic demonstrations of the behavior of metals embedded in tissue which is, specifically, that tissue will grow in close contiguity to a tissue-positive metal. When the contour of the metal creates an undercut, the tissue will not heal, providing a dense fibrous tissue counterpart capable of resisting displacement of the metal.

No permanent metal is inserted into the mucoperiosteum as in the case of the implant denture. Incisions are made only to provide an opening for the button and a fresh granulating surface against the metal embedded in the tissue side of a denture base.

Case History

A white male, age 52, who had worn a successful lower implant denture approximately two and one-half years, presented as chief complaint instability in the upper full denture in contrast to the security of the lower implant denture. Because of the simplicity of the button technique, it was considered advisable to attempt this technique.



1A. Illustrating markings of the mucosa for the button site.

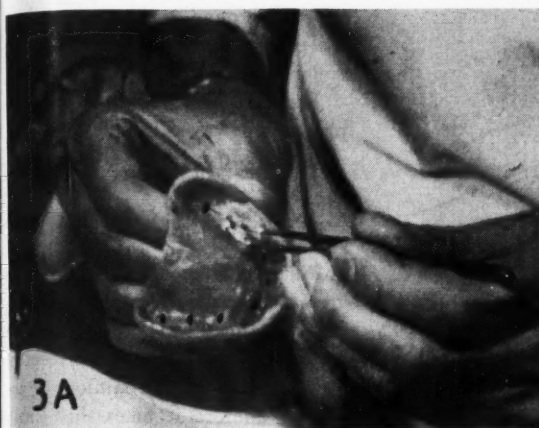
1B. Schematic drawing of Figure 1A.

2A. Duplication of the button site mark on the inside of the denture.

2B. Schematic drawing of Figure 2A.

Button Technique

Using the patient's denture, the button technique was applied in the following successive steps:



3A. Determining site of the box for the preparation and insertion of the button.

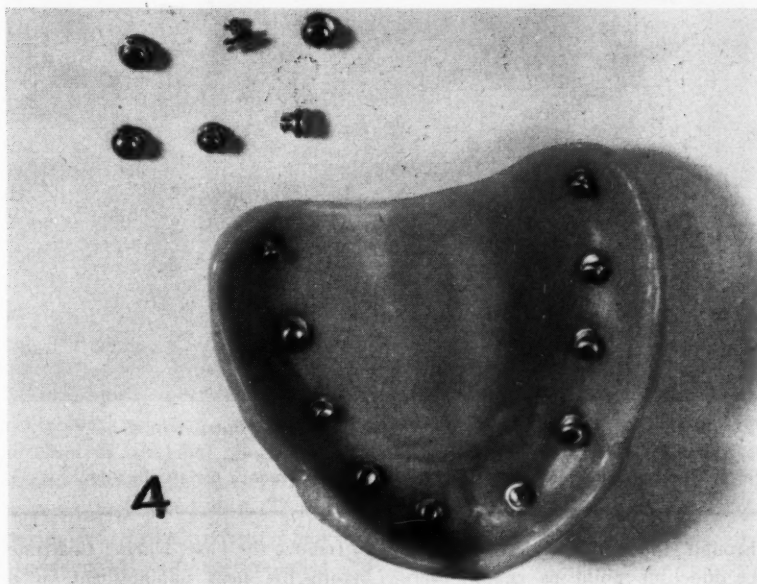
3B. Preparation of the box with inverted cone bur.

(1) The mouth was carefully examined for mucosa thickness, and contemplated distribution of the buttons to be employed (Fig. 1A).

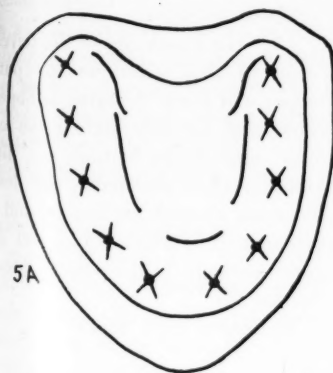
(2) Sites were selected for the creation of a female counterpart in the mucosa and marked with indelible pencil (Fig. 1B).

(3) The denture was placed in position and the marks were transferred to the denture base (Figs. 2A and 2B).

(4) The areas so marked were reduced to the depth of the button base



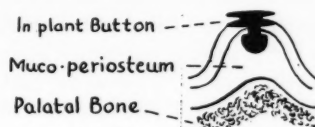
4. Denture with buttons inserted, cleaned, and polished.



5A. Schematic drawing of cross incision through mucoperiosteum at site of markings.



5B



5C

5B. Schematic drawing of the button used.

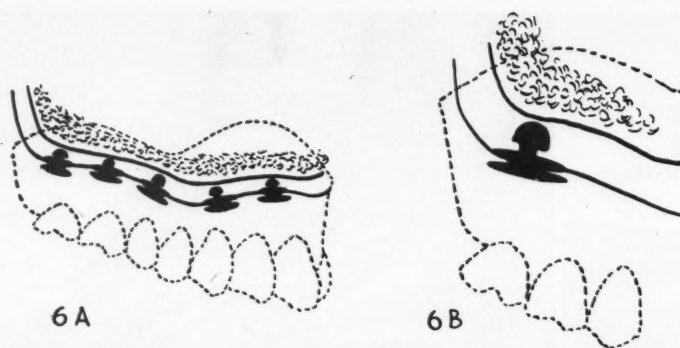
5C. Schematic drawing of the button in the denture pressing into the tissue.

with a large inverted bur. The buttons used were of Vitallium® and completely compatible with tissue (Fig. 3A).

(5) The buttons were fixed in position with rapid setting acrylic using the brush technique. Excesses were carefully finished and the hardened acrylic around the posts was polished (Fig. 3B).

(6) The buttons, fixed to the denture base, were stained and the denture was inserted, reproducing the position of the buttons on the mucosa (Fig. 4).

(7) The area of indelible point markings was infiltrated with several drops of anesthetic. Cross incisions



6A. Schematic drawing of the denture in place with buttons in tissue.
6B. Enlargement of Figure 6A.
6C. Month after healing illustrating opening in mucosa for the button.

through the mucoperiosteum, with the indelible point as center, were made approximately 4 to 6 millimeters in width, depending on the size of the button (Figs. 5A and 5C). When all openings had been made, the denture was inserted with firm pressure. At this point, both patient and clinician must note possible impingement on bone which would prevent the denture from correct positioning. Should there be such bony contact, the button may be lowered or the bone removed with a round bur.

Postoperative Progress

When all the buttons were in place, and the denture base uniformly in contact with the mucosa, (the posterior border was examined to confirm contact) the patient was dismissed with explicit instructions not

to remove the base. During this time before his next appointment in a week, the blood clot formed and tissue healing around the buttons took place. Organization of the blood clot occurs uneventfully around the button.

Formation of Granulation Tissue—The patient returned a week later reporting slight tenderness. Examination of the mucosa around the buttons showed pink healthy granulation tissue and some grayish surface desquamation. The retentive quality of the prosthesis was only slightly improved, if at all, because the pink granulation tissue at this stage offered slight resistance against displacement of the buttons (Figs. 6A and 6B).

Increased Stability—The second week the patient was advised to remove the denture only once a day. He reported increased stability. The

mucosa around the posts appeared more organized with a thickening collar of fibrous tissue (Fig. 6C).

The third week, the denture resisted physical downward pull, and when sufficient force was used to dislodge the denture a definite disengagement of the lips of the button socket occurred.

It has been the experience of Nordgren that four to five weeks is the minimal time for tissue to assume strong resistance to displacement of the denture. In the opinion of the present authors it takes this length of time for dense fibrous mucoperiosteum to form around the buttons.

Summary

The authors emphasize the prematurity of positive conclusions, but suggest the following possibilities from the application of this technique:

(1) The success or failure of the technique depends almost entirely on patient cooperation. If the patient should remain without the denture for an extensive period of time, obliteration will occur and the female component of the button will disappear in the mucosa.

(2) Gross balancing of occlusion must be made before the patient is discharged.

(3) It is emphasized that the longevity and function of this type of appliance is based on the verbal reports to the authors by the clinician quoted previously, which have not yet been published.

(4) The possibility of the development of this technique for partial upper and lower dentures is hopeful. The need for determining the optimum size of the buttons, the directions of their placement, the design for lower denture appliances, and the elimination of a palate in upper dentures are some of the potentialities to be realized.

36 Central Park South.

Author's Note: Gratitude is expressed to Eric Bausch of Austenal Laboratories for modifying and constructing the Vitallium® buttons designed for this technique.

The Diagnostic Significance

of NUTRIENT CANALS

ALEXANDER WEINBERGER, D.D.S., Philadelphia

DIGEST

This article is a discussion of extremely early signs of inflammation and pathologic changes in bone which can be detected in x-ray pictures as a chain-like pattern called chain black spotting. It is emphasized that the presence of chain black spotting or the nutrient channel for a blood vessel into which the spotting eventually forms is evidence of a pathologic condition and that preventive therapy should be applied.

Definition

There is little to be found in literature or texts relative to nutrient canals and that to be found is primarily in the form of x-ray pictures. The word nutrient infers a form of nourishment and the word canal suggests a blood vessel. The two words combined should refer to a blood vessel that is a source of nutriment. However, examination of the areas in which these predominate reveals only a pathologic entity.

Interpretive Factors

Figure 1 shows a dark line, large enough to be seen in the dental radiograph, that as far as can be determined is one of the blood vessels on the lateral wall of the maxillary sinus. In a sense this can be accepted as a nutrient canal and it is so termed; but on the basis of the present discussion it would seem to be indica-

tive of an irritated mucous membrane or involved sinus.

Bone Changes Discernible—Any source of irritation at the gingival area, whether it be an overhanging restoration, faulty crown margin, or calculus, produces changes in the bone which are discernible in the x-rays of the interseptal bone. The cancellous spaces and a line of black spots are evident. These are referred to as "chain black spotting" (Fig. 2). Chain black spotting can be seen in all cases of marginal gingivitis and, where teeth are slightly spaced, where there is food impaction. These are obvious sources of irritation and are presented as additional examples.

Response to Pathologic Change—The bone responds to pathologic changes (1) by condensing the bone, or (2) by opening the cancellous spaces. The former process involves an addition of calcium salts whereas the latter constitutes a withdrawal of calcium salts. Figure 3 is an example of the addition of lime salts and as such will not be discussed since this discussion is concerned only with the opening of the spaces.

Why nature prefers to form bone under one irritant and to withdraw bone salts under another is unknown although the possibility that the character of the irritant or the pH of the medium created may be the deciding factor is suggested.

Black Spotting Evident Before Clinical Symptoms—In Figure 2

note the line of black spotting on the mesial of the buccal root of the molar and the mesial side of the bicuspid. Overextended margins of restorations are evident. Figure 4 illustrates chain black spotting between the roots of a molar tooth. A rarefaction at the crest is indicative of bifurcation involvement. This black spotting can be seen long before there is any breakdown on the crest.

Aid in Prevention—In many cases of undetermined pain which have exhibited chain black spotting clinical examination invariably reveals a pocket formation. These are for the most part teeth that are in traumatic occlusion and if the chain black spotting is seen before clinical symptoms appear, the occlusion should be adjusted.

The chain black spotting can be seen long before there is pocket formation. These will be found to be specific for molar teeth that are subject to trauma; thus, if they are recognized during the examination of the radiographs, pocket formation can be prevented. When this has been achieved a fill-in of bone can be expected where breakdown has occurred.

Evidence of Gingivitis—If there are no evident sources of irritation, such as restorations or calculus, it is certain that gingivitis is present regardless of the clinical evidence. These patients complain of discomfort throughout the mouth and feel as if they would like to force a toothpick between their teeth. In fact, such a procedure tends to "feel good." In-



1. Arrows indicate a dark line running laterally across the maxillary sinus that has been identified as a blood vessel and called a nutrient canal.

2. Note the vertical line of black spots paralleling the roots. This is chain black spotting.

3. A deposition of lime salts at the apex of a tooth. The condensed area persists after the removal of the tooth.

4. Chain black spotting with rarefaction of the crest in the bifurcation of the roots of a lower molar tooth.

terdental stimulation properly applied will effect a cure if the cause of the condition is removed.

Warning Sign

Chain black spotting must be recognized as a warning sign. If the source of irritation persists, the area of black spotting becomes a dark line, or there is breakdown of the bone, or both, depending on the defensive power of the subject. Even the presence of the canals does not prevent this breakdown. Figure 5 illustrates nutrient canals with loss of crest height. The dark line is a channel in the bone that is filled with a blood vessel.

Pathologic State Indicated—Na-

ture's first line of defense against an irritant is to send blood to the part with subsequent inflammation. Any evidence, therefore, of nutrient canals is indicative of a pathologic condition. If the area is edentulous and there are nutrient canals or chain black spotting it is evident that before the teeth were removed there was irritation at the alveolar crest (Fig. 6).

Predominate in the Mandibular Incisive Region—This particular area is subject to irritation from calculus and trauma. For this reason nutrient canals predominate in this area. These teeth do not have the bony support, both cancellous and cortical, that exists for other teeth.

Pressure May be Cause of Pain—It is quite common to find the ridge painful under the pressure of a denture in the lower incisive region. Pressure of the denture on these nutrient canals has been cited as a cause of the pain.

Treatment Recommended—One method of therapy that has been recommended is that the soft tissue over the ridge be opened and the bleeding points in the bone, which supposedly represent the endings of the nutrient canals, be cauterized using phenol, silver nitrate, or zinc chloride.

Tissue Possesses Healing Properties—The author is in disagreement with the principle of the treatment suggested. In the author's opinion,

caustic substances, or medicaments, no matter how mild, should never be applied to bone tissue. The specific tissue under discussion has innate properties of healing and if the integrity of the tissue be maintained, the natural defenses of the tissue will effect a cure.

Preferred Procedure—In this particular problem the patient is best served by completing dentures that have the teeth out of contact in the incisive region in centric occlusion, and that are balanced in lateral and protrusive excursions.

Arrangement of Teeth in Denture Important—The presence of nutrient canals makes it imperative that added emphasis be given the arrangement of the teeth as stated above. It is also a reminder that this area of tissue has been subject to irritation over a long period of time.

Summary

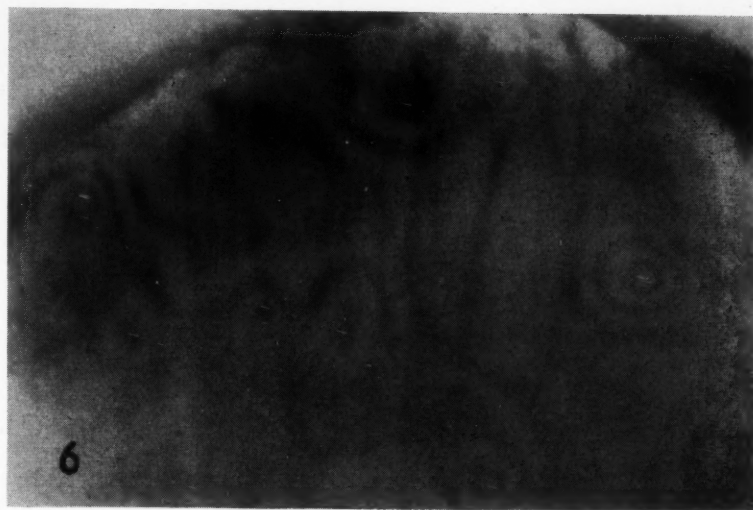
1. The earliest signs of inflammation and pathologic changes in bone result in, or cause a rounding of, the cancellous spaces which are revealed in the x-ray pictures as black spots. This black spotting is an opening of the cancellous spaces caused by the removal of lime salts which follow a chain-like pattern called "chain black spotting." In the bony interseptal spaces these chain spottings eventually form a chanel for a blood vessel which has received the name of nutrient canal.

2. Although inflammation is a normal physiologic process it is always the result of irritation. Therefore, the presence of chain black spotting or nutrient canals is evidence of the existence of a pathologic condition. Once the nutrient canals form they persist even after the removal of the cause; but where there is chain black spotting the cancellous spaces will return to their normal shape if the irritation is removed.

3. When examining the radiographs of the teeth and the adjacent bone the operator should look for chain black spotting and attempt to identify the cause. This may be a simple gingivitis, calculus, trauma, an overhanging restoration, food im-



5. Nutrient canals and loss of crest height in an area subject to trauma.
6. Nutrient canals remaining after the removal of the teeth.



paction, or an unusual source of irritation such as toothpick abuse and the tooth-brushing technique practiced.

4. Although black spotting is more easily detected in the interproximal areas it is not confined to these regions. In the early stages of pulp degeneration the spotting can be detected in the apical area of the involved tooth.

5. There is no reason for surgical interference where there is pain under a denture and the radiographs reveal nutrient canals. The patient is merely being subjected to needless discomfort and to insult tissue with the application of caustics or even mild medicaments can only injure the tissue or destroy it.

1002 Medical Arts Building.



1 (Center), 2, and 3. Roentgenographs of preoperative and postoperative studies of the case.

UNILATERAL OPERATION for Correction of Prognathism on Rotated Mandible

WILLIAM I. OGUS, D.D.S., Washington, D.C.

DIGEST

The outstanding feature of the operation for the correction of this case of chronic prognathism which had resulted in a serious personality maladjustment, was that it proved necessary to perform surgery on only one side of the mandible to obtain normal occlusion. The steps followed in the surgical procedure are described in detail.

Case History

The patient, a woman, twenty-four years of age, was referred with a chief complaint of prognathism since childhood. This condition had resulted in a personality impairment stemming from a masculine appearance and a speech impediment. The speech defect was essentially a constant lisp with difficulty in enunciating. Mastication was limited to the posterior maxillary and mandibular

second molars. The patient was otherwise in good health.

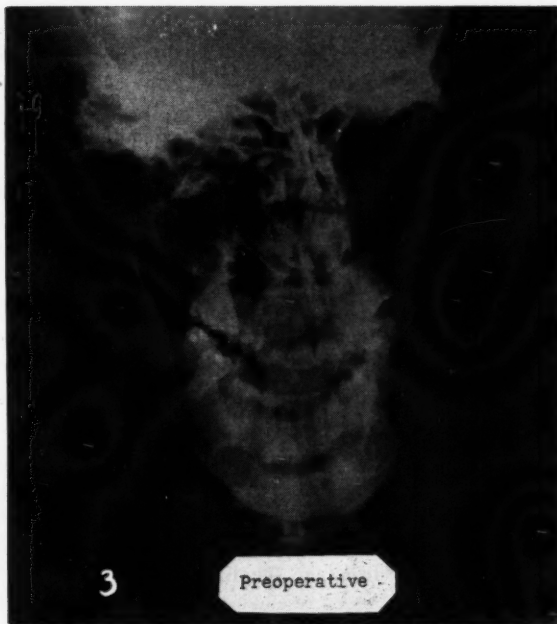
Roentgenographic Study—The results of roentgenographic study are shown in Figure 1 (center); Figure 2, which reveals extensive anterior protrusion with contact only on the first maxillary and second mandibular molars; and Figure 3 in which the anterior view shows an open bite.

Satisfactory Occlusion Possible—Study models demonstrated that satisfactory occlusion could be obtained by rotating the lower cast from left to right.

Surgery

The patient was admitted to the hospital, examined by the resident physician, and found physically fit for surgery.

Procedure—The following steps were taken:



1. Under general anesthetic the area of operation was sterilized and draped.

2. An incision was made $\frac{1}{4}$ inch above the angle of the mandible and below the posterior border.

3. The aneurysm needle was

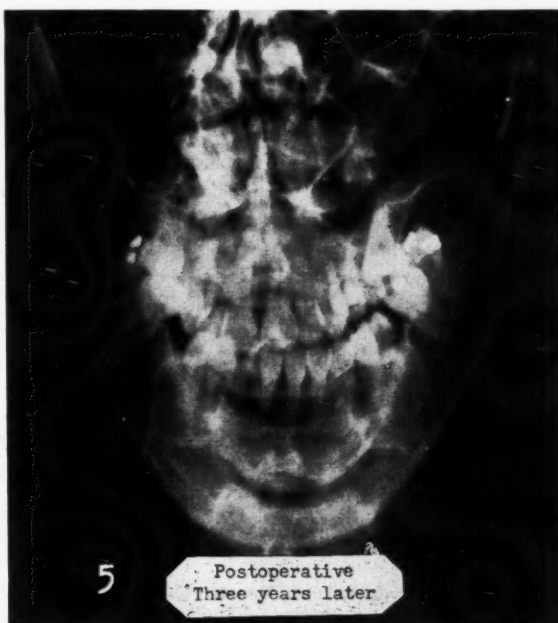
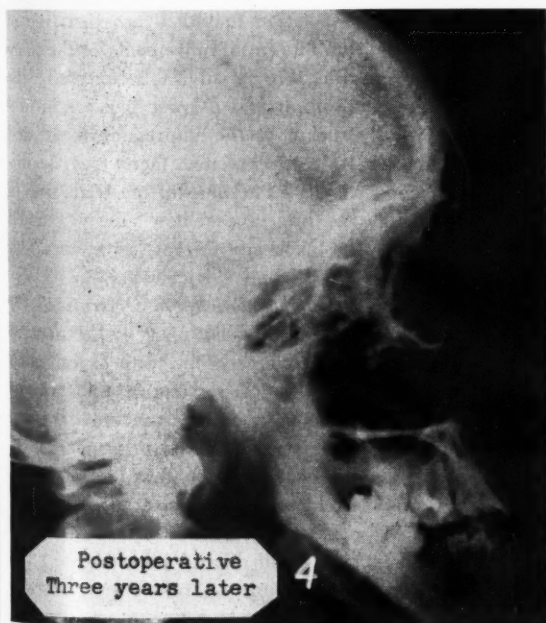
forced through following the internal border of the mandible until it could be felt externally above the anterior border of the mandible.

4. Another incision was made for withdrawal of the aneurysm needle.

A Gigli saw was attached by wire

through the eye of the aneurysm needle and brought forward through the path created by the aneurysm needle.

5. The wire was removed. Handles were attached to the Gigli saw, and with the aid of an assistant, the man-



4 and 5. The roentgenographic appearance of the case three years after surgical correction is shown. The outstanding feature in this operation was that only one side was corrected, due to the rotation of the mandible. The glenoid fossa and the condyle on the opposite side had given no

discomfort despite the fact that the condyle was rotated in the glenoid fossa. Prior to surgery it was not known that it would be possible to limit correction to one side only, nor that additional surgery might not be necessary.

dible was sawed through to complete a fracture on the left side.

Hemorrhage Controlled—As the mandibular artery, nerve, and vein were severed, hemorrhage was controlled by pressure. The incisions were sutured.

Normal Occlusion Obtained—The mandible was rotated posteriorly. It was found that the teeth came into normal occlusion.

Final Steps—The teeth were wired with continuous Stout wiring; loops

were left for the attachment of wire or rubber bands, upper and lower. Rubber bands were placed between the upper and lower loops to hold the mandible in position.

Postoperative Treatment

1. Recovery was uneventful. A liquid diet was maintained for three days.

2. Mouth irrigation was performed every four hours by Dakin syringe.

3. The patient was discharged

from the hospital after five days and returned to the office for treatment.

4. The wires were removed after five weeks. Paresthesia lasted fourteen weeks.

Conclusion

An immediate alteration occurred in the appearance of the patient. Adjustment in the personality defect was noted as well as improvement in personal relations.

1832 Eye Street, N.W.

Spoon Dentures

THE SPOON denture is a type of partial upper denture replacing a few anterior teeth. The part of the denture which rests on the hard palate is kept well away from the standing teeth and in many cases resembles a spoon in shape.

Advantages of the Spoon Denture—It does not encroach upon the standing teeth or their gingival margins and is therefore unlikely to give rise to pathologic changes in the mouth.

Success not Invariably Assured—Every failure in application of the spoon denture is due to faulty assessment, either of the shape of the patient's mouth, or of his personality, or both.

History

Advent of Acrylic Resin—With the use of acrylic resin, labial tissue construction is no longer displeasing. It has been found that if the artificial teeth are set up in their correct esthetic position with the correct gingival contour, tissue simulation is needed in virtually every case.

Basic Principle—Retention of the acrylic spoon denture is obtained primarily by means of the frictional grip between the natural teeth and that between the labial artificial tissue and the spoon in the palate. In many patients there is a slight undercut between the labial aspect of the alveolar ridge and the anterior section of the palate, of which use can be made. Adhesion, cohesion, and tongue control play a certain part, but they are relatively unimportant.

Applications—The spoon denture is

suitable for replacing upper incisors and cuspids. Up to four teeth can be carried on one denture. These need not necessarily be adjacent.

Indications in Use of Spoon Denture

Clinical Indications—A high, narrow palate, together with a high reflection of the mucous membrane labially gives the best retention. It is especially helpful if the artificial tissue can be taken laterally toward the apex of the teeth on either side.

General Contraindications—The spoon denture is not advocated for the following three personality types: (1) The irresponsible teenager or adult who finds it hard to remember and who will, in consequence, lose the denture; (2) the "worrier," who, unless presented with a formidable array of clasps will remain unconvinced of retention; and (3) the "fidget" with his restless tongue.

Clinical Contraindications—(1) An extremely flat palate, together with a low reflection of the labial mucous membrane and little or no absorption of the alveolar ridge will give the minimum of retention. (2) An extremely close bite, or gross irregularity of the standing teeth will cause instability during mastication. (3) Protrusion of the upper incisors, if marked, will cause instability as the lower lip will dislodge the denture on approximation of the lips.

Design and Technique of Construction

The impressions may be taken in any material. It is important to ensure

that the material flows well up into the buccal sulcus, and that the impression is muscle trimmed to the fullest extent.

Casting the Model—If the impression has been taken correctly, the exact outline of the tissue reproduction can be marked on the model to give maximum retention. Over-extension must be avoided at all costs because any movement of the upper lip will cause instability of the denture. This point must be checked carefully at the try-in stage.

Setting up Artificial Teeth—The artificial teeth must be set up in such a position that they are just free of the bite in all movements of the mandible. It is advisable to study the position of the lower incisors in protrusion at the impression stage and if it appears that there may be difficulty in setting up the teeth free of the bite, a face-bow reading should be taken and the models mounted on an anatomic articulator.

Correct Thickness Determined for Each Case—The part of the denture which connects the teeth to the spoon must be of reasonable thickness as there is a certain amount of stress in this region during mastication. If the acrylic is too thin, a fracture is likely to occur, sooner or later. The correct thickness of the tissue facsimile will depend in each case upon the amount of resorption that has taken place and the muscle tone of the upper lip. The spoon itself can be made as thin as Number 7 casting wax.

Size of Spoon Varies—Generally
(Continued on page 332)

Fundamentals in Mouth Reconstruction

and the TEMPORAMANDIBULAR JOINT SYNDROME

PART TWO

HARMON SHOHEI, D.M.D., Boston

DIGEST

This is the second installment of a two-part article on the subject of mouth reconstruction and its importance in relation to the temporomandibular joint. In this installment step-by-step directions are given for successfully completing a satisfactory technique.

Preparations

For successful preparation of teeth for reconstruction the underlying principles should be observed.²⁰ It is helpful to plan and indicate on the articulated study models the type of preparations to be made:

1. For anterior teeth, jackets are preferable if the bite is to be opened extensively. Otherwise three-quarter crowns or the Shohet semi-veneers can be used.²¹

2. For bicuspid and molars either MOD inlays, semi-veneers, or three-quarter veneers are used if the bite opening is more limited.

3. In other cases jacket crowns, porcelain or acrylic veneered full crowns, or all gold crowns are used.

Basic Technical Provisions—In all preparations the following fundamental requirements should be observed:

1. Always estimate the load each tooth will be obliged to carry and the strain to which it will be subjected and choose the type of prepa-

ration most satisfactory under these conditions.²²

2. The occlusal part of all castings should be thick enough to withstand the normal strain and wear expected in the course of years.

3. After all the castings are tried in the patient's mouth it is sometimes necessary to correct the occlusion by grinding. It is therefore wise to make a casting a little too thick than too thin. Provision for this should be made in the preparations.

4. It is important to maintain the vitality of all teeth; execute all grinding carefully without overheating. Extend all margins to zones of immunity and as far under the free margin of the gingiva as possible. Avoid unnecessary mutilation of the gingivae and periodontium, however, which may result in subsequent recession and periodontal difficulties.

5. Design preparations so that they will be retentive under conditions of strain and occlusal stress. In general, box preparations have more retention than slice preparations. The walls of a preparation should not be tapered too sharply.

6. A cavity outline should include within its range any grooves, fissures, and sulci. To preserve tooth substance and to avoid injury to the pulp, the cavity outline on occlusal surfaces should follow the depressions and eminences of the cusps and sulci. If the cavity extends into the range of the forces of occlusion and mastication, it is usually advisable to overextend it beyond this range. All sup-

ported enamel should be removed.

7. For better retention all seats should be flat and in a plane at right angles to the stress of mastication. All anchorage and retention should be made in dentin, not in enamel.

8. All caries must be removed, the cavity carefully sterilized, and if close to the pulp, the latter must be protected with a pulp-capping material.

9. The lower first bicuspid is an unsatisfactory abutment unless most or all of its surfaces are included in the preparation.

Use of the Disc—1. If the preparations are carefully planned in advance, with competent assistance several can be completed on one side at once. For patient comfort and to hasten preparation the author uses diamond discs and stones kept chilled by the assistant with (1) a spray of lukewarm water, or (2) a stream of cold air directed upon the tooth under preparation.²³

2. Many cases require local or other anesthesia.²⁴ In these cases, too, the tooth should be kept cool to prevent overheating and pulp injury.

3. A disc revolving at high speed but applied with light pressure is more efficient and less painful than one used at lower speed with greater pressure. Cutting with discs should not be an uninterrupted operation; this procedure should be accomplished by intermittent application of the stone.

Completing the Preparation—(1) The preparations should be finished with sandpaper discs, dried, sterilized, dried again, and the dentinal tubules sealed with varnish. (2) The

Author's Note: Acknowledgment is made to James B. Costen, M.D. for permission to reproduce illustrations from his article SYNDROME OF EAR OR SINUS SYMPTOMS, *Annals of Otolaryngology and Rhinology* (March) 1934; and to the *Journal of the American Dental Association* for permission to use illustrations from ATLAS OF THE MOUTH.

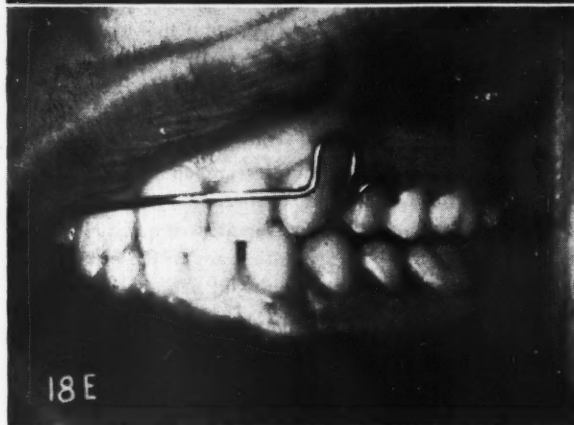
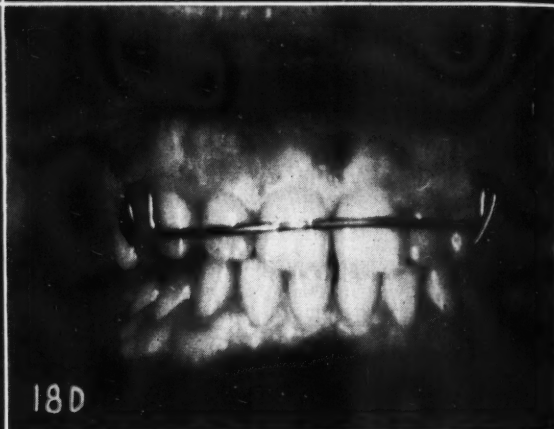
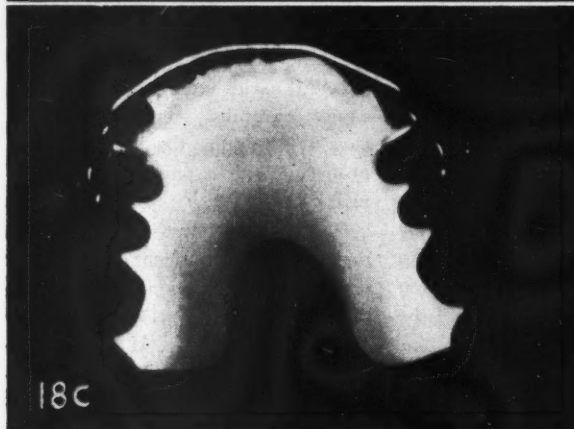
²⁰Tylman, Stanley D.: *Theory and Practice of Crown and Bridge Prosthesis*, St. Louis, C. V. Mosby Company, 1940.

²¹Shohet, Harmon: A New Type of Support for Fixed Bridges, *D. Items Interest* 55:370 (May) 1933.

²²Schwartz, J. R.: *Cavity Preparations and Abutment Construction in Bridgework*, Brooklyn, Dental Items of Interest Publishing Company, 1936.

²³Killilen, J. F.: Air-conditioned Handpiece, *J.A.D.A.* 32:966 (Aug.) 1945.

²⁴Shohet, Harmon: Nitrous Oxide Anesthesia, *D. Items Interest* 1:370-378 (May) 1928.



18A and 18B. Case showing closed bite and distal displacement of the mandible. The patient, 19 years old, complained of snapping and crackling noises at joints, pain at

joints when chewing hard foods, and occasional subluxation during speech. There was also pain in the left joint when external pressure was applied or when the mandible was moved laterally to the left side.

18C. A Hawley Plate was constructed which opened the bite $3\frac{1}{2}$ millimeters and permitted the mandible to move forward to its normal position. Only the six lower anteriors were permitted to make contact with the plate; the bicusps and molars were kept out of occlusion.

18D. Anterior view showing Hawley Plate in mouth.

18E. Lateral view with Hawley Plate in mouth showing bicusps and molars out of occlusion and corrected mesiodistal position of mandible. (Compare with Fig. 18B.) Two months later the patient reported all symptoms mentioned in Fig. 18A and Fig. 18B (except that of crackling) had disappeared. The crackling, too, was much less pronounced. It is hoped that by wearing the Hawley Plate the upper and lower bicusps and molars will eventually come together to make occlusal contact at the new vertical height and hold the mandible in its new position.

tooth should then be covered with a protective agent to prevent thermal shock or movement in any direction.

Protection of Prepared Teeth

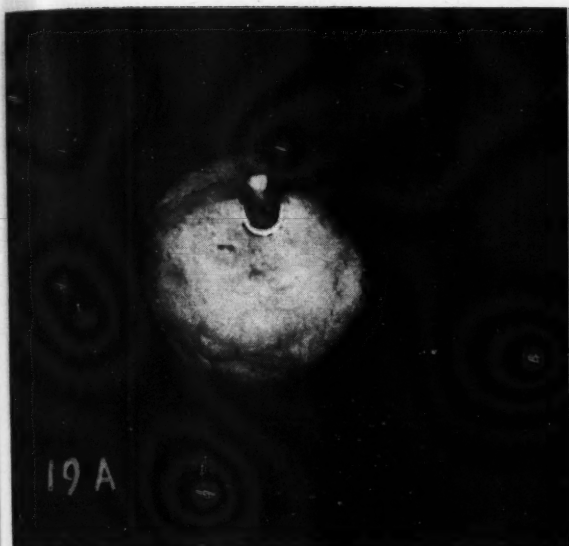
Constructing Posterior Splints—In

the construction of temporary splints the following steps are taken:

1. After the aluminum shells of the proper length and width are fashioned carefully to fit the gingival margins and adjusted to proper occlusion, most of the occlusal metal

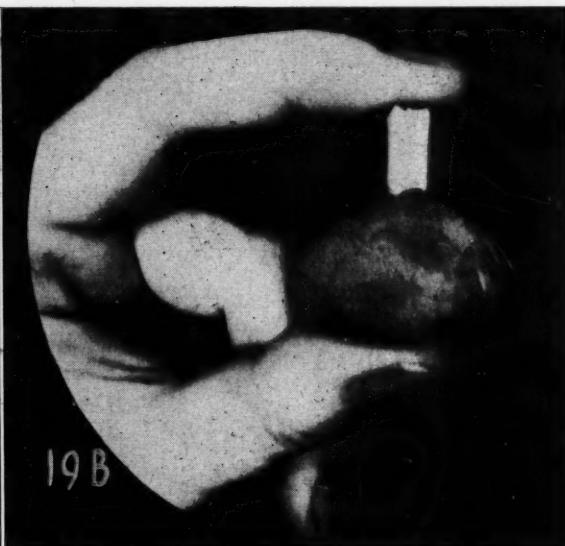
and much of the interproximal metal is cut away.

2. With the prepared teeth lubricated and the aluminum crowns in position, acrylic is applied to the cut-out occlusal and interproximal areas and the bite is closed.

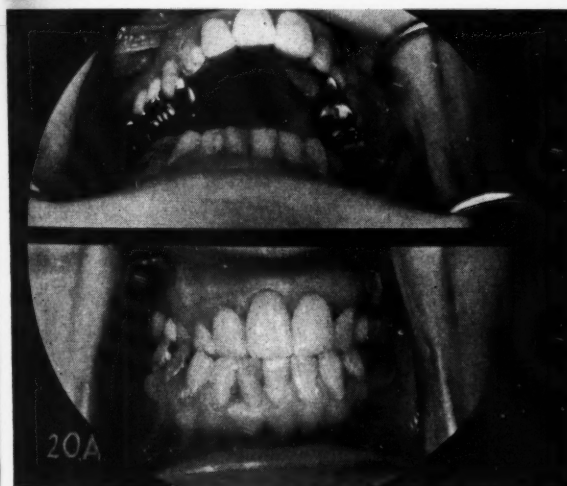


19A. Author's method of construction of counterdies. The prepared die is embedded in moldine as far as the shoulder or chamfer.

19B. A copper tube is fitted loosely to the contour of the die and placed over it and into the moldine. Low fusing metal is then poured into the tube and chilled at once. For



greater accuracy, the counterdies or those dies that are to be used in constructing bridge abutments are cast by the conventional casting methods with the same type of gold that will be used for the final abutment casting. The little extra time required for this precaution will frequently prevent inaccuracies in the bridge assembly.



20A. Before treatment. The locking effect of the abnormal occlusion prevented free lateral movement of the mandible.



20B. The case shown in Fig. 20A after treatment.

3. Before the plastic has completely hardened, the series of crowns held together by the acrylic are carefully removed.

4. When the setting of the acrylic has been completed, this temporary plastic splint is smoothed and polished with sandpaper and pumice, and cemented in place with zinc oxide and eugenol to which a little vase-

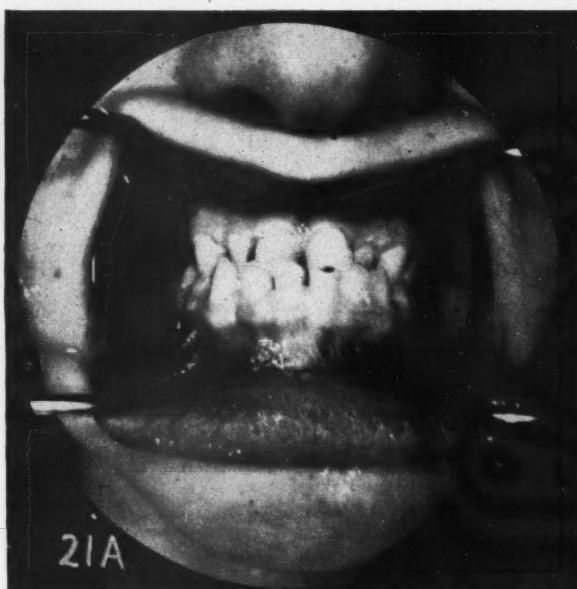
line is added, or with Wondrpak®.

Anterior Splints — 1. The same procedure may be followed in constructing temporary anterior splints, using plastic crown forms, with holes punched in the interproximal surfaces, instead of aluminum.

2. As the crown forms filled with acrylic are forced over the lubricated teeth and adjusted to proper occlu-

sion, some acrylic will ooze out interproximally and unite the crowns into a splint.

3. The temporary splint is carefully removed from the teeth before the acrylic has fully hardened, finished and polished outside of the mouth, and cemented into place with a mixture of zinc oxide, eugenol, and vase-



21A and 21B. Anterior and lateral cuspal interferences cause a locking of the bite which prevents free movement of the mandible in all directions. The patient complained of tinnitus that dated back several years, nausea, and pain in the temporomandibular joints. Two temporary bite-

blocks were constructed, opening the bite 4 millimeters, which relieved the interference and unlocked the bite. The missing posterior teeth were replaced at the same time; in this way the bite was balanced. After wearing the appliances two weeks, the patient was much improved.

4. Temporary crowns should be fitted carefully and must not be too large or permitted to extend too far under the gingival margin. After a temporary crown has been placed in position, it is important to remove all of the excess cementing material that may have been forced under the free margins of the gum. Failure to observe these precautions may predispose the teeth to periodontal difficulties (1) from the gingival irritation that may ensue, or (2) by the development of pockets from material retained under the margin for several days.

Counterdies

Counterdies are useful in placing dies in accurate position on the model and also as guides to the desired length and contour of the crowns to be fabricated.⁴

Procedure—1. Each die is coated with varnish and painted with a thin paste of zinc oxide and water. The root section of the die is then set into a lump of moldine so that the entire root is covered with moldine up to the chamfer or shoulder outline of the preparation (Fig. 19A).

2. An oversized copper tube of the proper length is shaped to the die crown exposed in the moldine, placed over the die, and pressed slightly into the moldine supporting the die root.

3. Low fusing metal is poured into the copper tray surrounding the die, pressed into place with the finger, and chilled at once with cold water (Fig. 19B).

4. After the copper band is cut at one side and peeled away, the counterdie is removed and trimmed to the proper length and contour by fitting it to the corresponding tooth in the mouth.

5. Care should be exercised in trimming the length and contour of these counterdies to approximate the length and contour of the desired finished crowns, using the adjacent and occluding teeth as guides.

6. For greater accuracy the counterdies of the dies that are to be used in constructing bridge abutments are cast by the conventional casting method with the same type of gold that will be used for the final abutment casting. The small amount of extra time required for this precaution will frequently prevent inaccur-

racies in the bridge assembly.

Guides to Length and Contour of Crowns—1. With all the completed counterdies in place over their corresponding crowns, a plaster impression is taken. The dies are inserted into the counterdies after the impression is removed and a stone model is poured. In this way the dies are placed in accurate position on the model.

2. By removing one counterdie from its die on the completed model (keeping the two adjacent counterdies in position) the technician is guided by the adjacent counterdies in determining the desired length and contour of the casting to be made.

Occlusion

Haphazard replacement of missing teeth, or the restoration of broken-down crowns with little regard for the occlusal relationship in the remainder of the mouth is common practice.

Causes of Reduction of Vertical Length—(1) Careless occlusal restorations, (2) failure to replace teeth lost early in life, and (3) habit often cause the tipping of teeth and shift-

ing of the bite to one side or the other, or mesiodistally, resulting in a reduction in the vertical height.

Obstacles to Correct Occlusion—

(1) Teeth adjacent to the unfilled spaces migrate and tip and those opposite the spaces elongate. (2) The elevated and interfering cusps prevent a normal excursion of the mandible and in some cases the lateral or protrusive movements of the mandible are prevented by the locking effect of the cusps of teeth that have drifted or elongated.

Temporomandibular Joint Syndrome—All the factors enumerated may lead to temporomandibular joint disturbance and related sequelae, usually referred to as Costen's Syndrome. The following symptoms may be present:

- (1) Pain in and about the ears
- (2) Stuffy sensation in the ears
- (3) Dizziness
- (4) Crackling, snapping noise while chewing
- (5) Tenderness to palpation
- (6) Headache
- (7) Burning sensation of tongue
- (8) Excessive movement of joint
- (9) Dryness of mouth and neuralgia

22A. Loss of vertical height and unbalanced bite due to absence of posterior teeth. The patient had limited motion at the temporomandibular joints and suffered severe pain with every attempt to open the mouth or move the mandible laterally. The patient also complained of frequent subluxation, especially in the morning, and crackling at both joints.

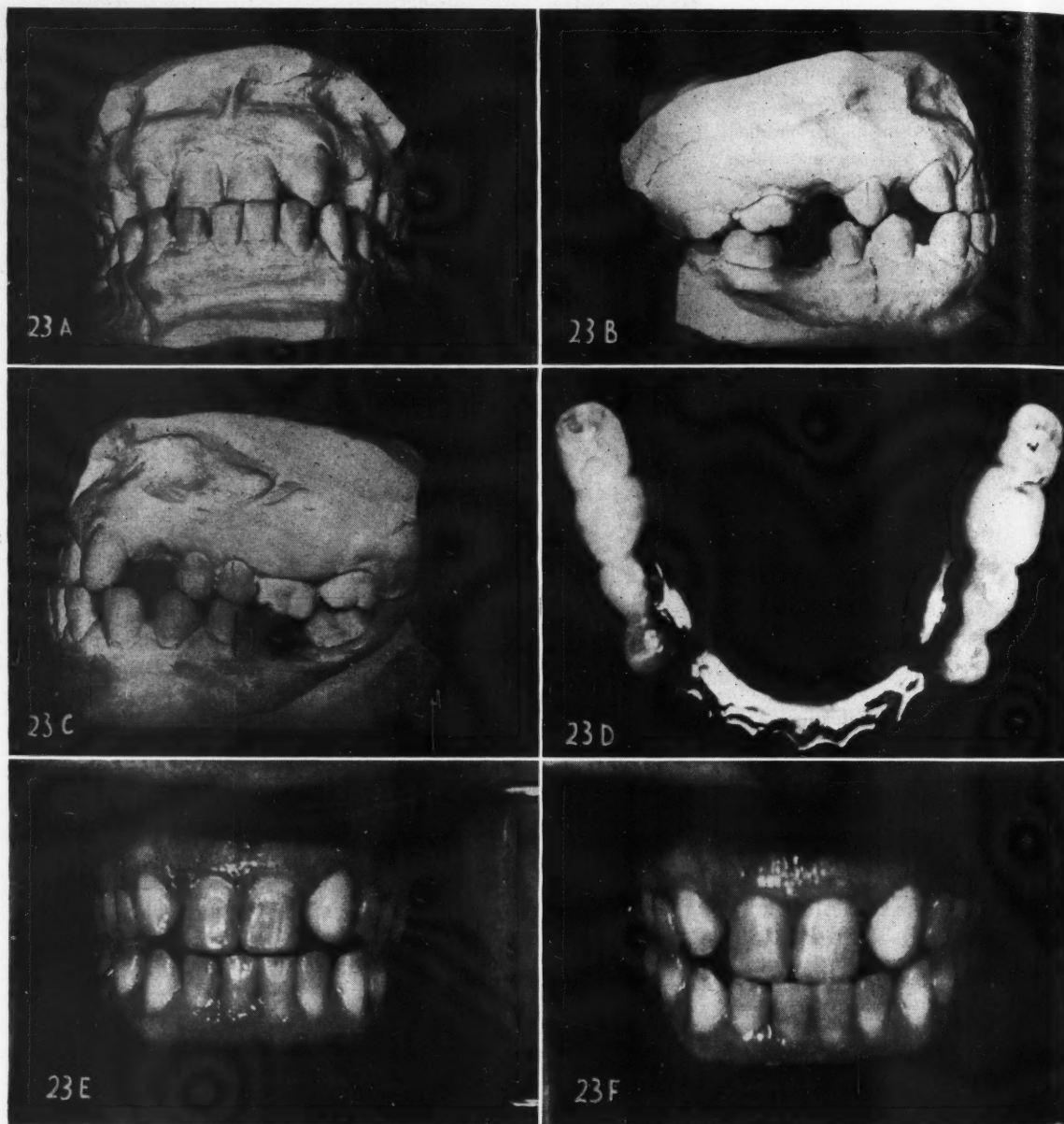
22B. Case shown in Figure 22A showing unbalanced bite due to absence of posterior teeth on the right side.

22C. Case shown in Figure 22A showing unbalanced bite due to absence of posterior teeth on the left side.

22D. Lower and upper acrylic bite-blocks were made for two purposes: a) To open the bite 4 millimeters. b) To balance the bite with occlusal contacts in the molar and bicuspid areas.

22E. Same case with the patient wearing upper and lower bite-blocks. Ten days later the patient was able to move the mandible vertically and laterally within normal limits and without any pain. The patient no longer experienced any subluxation.





23A. Front view of case showing closed bite and mesial displacement of mandible. The patient, a 35-year-old teacher, complained of pain in the ears, a blocked-up feeling in the ears, diminished hearing acuity, and crackling noises in the right temporomandibular joint.

23B. Right lateral view of case shown in 23A.

23C. Left lateral view of case shown in 23A.

23D. Same case shown in 23A. A bite-block was constructed which opened the bite about 4 millimeters, unlocked the mandible, and permitted it to slide back distally

into its normal position in the temporomandibular joint.

23E. Same case shown in 23A with patient wearing bite-block. Within 10 days all of the symptoms had disappeared. Although her hearing has not yet been tested, she feels it has improved. The patient's general physical condition has also improved and she feels better than she has in many years.

23F. After wearing the bite-block 10 days the mandible has assumed a more normal mesiodistal position even with the bite-block removed. (Compare with Fig. 23A.)

(10) Tinnitus and diminished hearing acuity^{1,2,3,7,8,9,10}

Objectives in Occlusal Restoration

—It is important to replace lost teeth before the adjacent and opposite

teeth have drifted or elongated and to complete crown restorations so that the following requirements are fulfilled: (1) All the occlusal planes or both arches must be precisely co-

ordinated so that the mandible can move freely without cusp interference in all directions, protrusive and lateral; and (2) a harmonious relationship must be obtained between

the condyles and the teeth.

These conditions must be obtained to prevent the possible temporomandibular joint symptoms described or soreness and loosening of teeth, pulpitis, death of pulp, periodontal involvement, neuralgia, or loss of teeth.

Review of Procedural Axioms

1. The first step in any restoration is the correction of existing occlusal abnormalities and the establishment of a normal Curve of Spee with the existing teeth by shortening all elongated cusps or crowns and equilibrating the bite with careful judicious grinding.

2. All necessary replacements must be fabricated on some form of anatomic articulator, utilizing complete maxillary and mandibular models for all cases involving more than two replacements.

3. All restorations must be fabricated with occlusion that will permit the free movement in all directions without any cuspal interference.

4. Free excursion of the mandible will sometimes necessitate (1) a lack of contact of a buccal or lingual cusp, (2) shorter anterior teeth than originally planned, or (3) an overjet of the anterior teeth to be replaced.

5. To reduce the strain on the abutment teeth, (1) the occlusal surfaces of all restorations should be narrowed buccolingually as much as possible consistent with good practice, and (2) all carvings should be made shallow and with short cusps.^{4,5}

6. No restoration should extend occlusally beyond the normal Curve of Spee. If there is an abnormal Curve of Spee on the occluding side, the abnormality must first be corrected by adding or subtracting as required. If adding to the depressed opposing occlusion is not possible, the occlusion of the restoration must be fabricated short of contact to keep it within limits of a normal Curve of Spee. Under these conditions the splinting of the restoration with the adjacent teeth will prevent elongation.

7. Correct vertical length with a

balanced occlusion of maxilla and mandible and carefully coordinated occlusal planes is required to maintain a normal healthy state of both temporomandibular joints. More than any other single factor correct occlusion is responsible for the success or failure of any dental reconstruction or appliance.

8. Multiple splinting of loose teeth or teeth with little bone support is a useful procedure, provided the loose teeth are tied in with adjacent teeth that have good bony support.

9. The freeway space is the most satisfactory guide to determine the proper vertical height. Conservatism is emphasized.

10. Careful planning of all phases of the complete restoration is a prerequisite to obtain esthetics, hygiene, function, comfort, and health.

11. Cooperation with the otologist or otolaryngologist is indispensable in all cases involving temporomandibular joint syndrome.

20 Gloucester Street.

Focal Infection

THAT THE theory of focal infection has fallen in part into disfavor in the past ten or fifteen years is due partly to the following observations that seem to discredit it:

1. Many patients with diseases presumably caused by foci of infection have not been relieved of their symptoms by removal of the foci.

2. Many patients with these same systemic diseases have no evident focus of infection.

3. Foci of infection are, according to some statistical studies, as common in apparently healthy persons as in those with disease.

Theory Not Disproved

The comments cited appear damning but it has been pointed out that none of them actually disproves the theory that some foci of infection can, in the presence of predisposing or

accessory factors, produce some systemic diseases. The removal of the focus of infection may not eliminate the disease it initiated or reverse permanent tissue changes. This does not prove, however, that the focus did not initiate the disease, or that earlier removal of the focus might not have prevented advance of the disease. Likewise, failure of removal of a single focus to affect the progress of a disease does not prove that other undiscovered foci are not responsible for its maintenance.

Possibility of Similar Mechanism—The failure to find foci in some patients with diseases commonly attributed to foci does not prove the absence of concealed foci or the absence of foci at the time of initiation of the disease. Also, it does not prove that a mechanism similar to that of focal infection is not operative in

these cases, as when bacteria present on the surface of the oral, respiratory, gastrointestinal, or genitourinary mucous membranes penetrate these natural barriers, following physical trauma, chemical irritation, or vascular disturbances, and produce a temporary bacteremia.

Basic Theory Valid—The fact that foci of infection are present in many persons without systemic disease does not prove that foci are incapable of producing disease. It only proves that foci alone, without accessory factors, such as trauma, circulatory disturbances, or alterations in immunity are not sufficient to produce secondary disease. Thus on logical grounds alone the basic theory cannot be discarded.

Support of Modified Theory

Certain foci are known to be capable of producing disease.
(Continued on page 331)

Antihistamine Drugs to Inhibit Edema FOLLOWING ORAL SURGERY*

COMMANDER W. BASIL JOHNSON (DC) USN, Philadelphia

DIGEST

On the assumption that histamine is released from the tissue due to traumatic surgery thus causing localized edema, the results of observation of a series of ten cases in which antihistamine therapy was prescribed is reported herein.

Complication the Cause of Anxiety

Postoperative edema following oral surgery procedures has been an accepted complication by the oral surgeon, but to many patients this is an alarming complication and the cause of much anxiety. This is particularly true of the ambulatory patient and has frequently prevented the patient from returning for additional prescribed surgical treatment.

Case Report

A chance discovery of the action of the histamine antagonists in the prevention of edema following the surgical removal of an impacted mandibular third molar and an erupted, malposed, maxillary third molar on the same side led to further clinical observation of this phenomenon.

History—A young man had presented himself to the oral surgery service for the removal of an impacted mandibular third molar of the mesioangular type and a fully erupted maxillary third molar of the same side. These teeth were removed with

no undue trauma or other difficulty.

Postoperative Treatment—The use of an ice bag to the operated side and necessary sedation were included in postoperative measures. The following day when the patient returned for treatment there was considerable edema present. This disappeared in four or five days.

Second Oral Procedure—Two weeks later the remaining impacted mandibular third molar of the mesioangular type and an unerupted maxillary third molar were surgically removed. These procedures were completed uneventfully.

Antihistamine Drugs Acquired—On leaving the oral surgery service the patient was given some antihistamine drugs to use to prevent an incipient coryza. When he presented himself the next morning for postoperative treatment there was no edema discernible.

Sedation Unnecessary—On questioning the patient it was learned that he had taken four antihistamine tablets at intervals on the day of operation. The patient also added that it had not been necessary to take the prescribed sedation.

Histamine

Histamine is present in both animal and vegetable tissue. Chemically it consists of beta-iminazolyethylamine. Selle¹ has postulated that histamine is bound as precursor or as an inactive form in most tissue cells of the body. The intracellular reac-

tion between antigen and antibody or reagin action results in the liberation of histamine or an "H" factor.

Dissociated Form Possible—It is also possible that histamine is active in the cells in an easily dissociated form and that it becomes effective only after damage on irritation of the cell.²

Relationship to Cause in Edema—Kivimäki states that experiments have proved that histamine creates an expansion of the capillaries, a lowering of blood pressure, and damage of the capillary endothelium. This leads to a flow of plasma into the surrounding tissues, a thickening of blood, and an increase of the red blood corpuscles. The expansion of the capillaries and damaging of the endothelium signify an intense disturbance of the circulation.

Theory Corroborated—Kessler and Van Emburgh³ quote Feinberg, Malkiel, and Feinberg who state that histamines cause capillary dilatation followed by localized edema due to the passage of plasma proteins and fluids into the extracellular spaces surrounding tissue by virtue of changes in the permeability of the vessel walls.

It can thus be assumed that histamine has a definite relationship in the cause of edema resulting from

*The opinions or assertions contained herein are personal ones of the writer and are not to be construed as official or reflecting the views of the Navy Department or the Naval Service at large.

¹Selle, W. A.: Histamine, Texas Report Biol. and Med. 4:141 (Summer) 1946.

²Kivimäki, Juuso: On the Influence of Antihistamines in Operative Procedures, Suomen Hammaslääkärisseuran Toimituksia 48:14-19 (First Quarter) 1952, Supplement 1.

³Kessler, M. M., and Van Emburgh, G. H.: The Use of Antihistamines in the Treatment of Surgical and Accidental Trauma, Industrial Med. (Chicago) 20:12, pp. 567-570 (Dec.) 1951.

oral surgery procedures of all types.

Hyaluronidase Factor—Inflammatory tissue has a higher hyaluronidase content than normal tissue and the antihistamines have the capacity to destroy or limit the action of hyaluronidase which is known for its spreading factor.³

Antihistamine Action—According to Wolfred,⁴ the accepted hypothesis of the antihistamine drugs is that they attach themselves to the histamine receptors in the cells, blocking or preventing attachment of the histamines released by the reagin reaction. They also prevent capillary permeability and vasodilatation as evidenced by decreased erythema response. They have by themselves very little pharmacologic activity and in therapeutic dose do not significantly affect a normal organism. They will produce their effect only under pathologic conditions where histamine is released. A solution of histamine will not be destroyed or its action modified when mixed with antihistamine drugs "in vitro."

Antihistamine Toxicity—Manifestations⁴ such as vertigo, drowsiness, headache, or gastrointestinal irritation seldom necessitate the discontinuance of these drugs because of these effects. Few blood dyscrasias or tissue toxicity in therapeutic doses have been demonstrated and cumulative and addictive properties have not been reported.

Clinical Observation of Antihistaminic Therapy

Ten cases were selected for observation on the basis that similar conditions requiring oral surgery existed in both bodies of the mandible and in each maxilla; that is, all of the patients had maxillary third molars

to be extracted (1) fully or partly erupted, (2) unerupted or impacted. The mandibular third molars in all the patients were of some type of the Winter classification of mandibular third molars. Local anesthesia (2 per cent) was used in all cases.

Controls—The mandibular and the maxillary third molars were extracted on one side without the benefit of the antihistamine drugs to serve as controls.

Postoperative Instructions—The application of an ice bag to the operated side and sedation were advised for pain. When seen the following day, edema was evaluated. Postoperative treatment was continued for a period of three to five days. In approximately two weeks (the interval varied slightly) the remaining two third molars of the patient previously operated were extracted and the patient was placed on antihistaminic therapy and observed.

Therapy—1. Antihistaminic therapy consisted of a 50-milligram tablet of Benadryl® (Parke & Davis), or Pyribenzamine® (Ciba) fifteen minutes preoperatively.

2. Upon completion of the operation the patient was given another 50-milligram tablet and thereafter every four hours for three doses.

3. No ice to the operated side was prescribed; sedation was ordered for pain only if necessary.

4. On the following morning the patient was evaluated for any swelling that might have occurred, and questioned as to the necessity of taking the prescribed sedation.

Results—1. In five cases there was no swelling present and in two of the cases it was found necessary to take the prescribed sedation.

2. In four cases there was slight edema which had completely disappeared two days postoperatively. Of

these four cases, two found it necessary to take the prescribed sedation.

3. In one case there was considerable edema. This case required sedation for control of pain. The edema disappeared in three days, during which time the patient was kept on antihistaminic therapy.

4. In all of the control cases (not treated with the antihistamine drugs) edema developed ranging from slight to considerable.

Toxicity Observed—Toxic effects in the medicated were manifested in two cases, both with the complaint of drowsiness.

Conclusion

1. Those patients receiving antihistamine therapy showed a consistent lack of edema postoperatively.

2. Postoperative swelling was at least one-third to two-thirds less than in the non-medicated.

3. Histamine is an important factor in the development of edema. Since some edema resulted in four cases of those receiving the antihistamine therapy it must be considered that there may be other factors involved, such as the hyaluronidase factor.

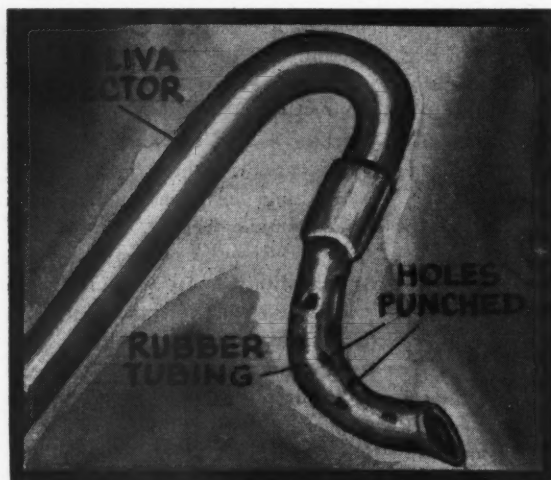
4. A decrease in postoperative pain and a decrease in postoperative sedation therapy was observed.

5. The author is now using antihistaminic therapy in many routine oral surgery procedures and believes that it has vast possibilities in the early supportive treatment of traumatic maxillofacial injuries. It is suggested that in the maxillofacial cases the antihistaminic drugs should be introduced parenterally.

University of Pennsylvania, Graduate School of Medicine, Oral Surgery Course.

⁴Wolfred, Morris M.: Antihistaminic Drugs in Dentistry, *Am. J. Pharm.* 123:13-18 (Jan.) 1951.

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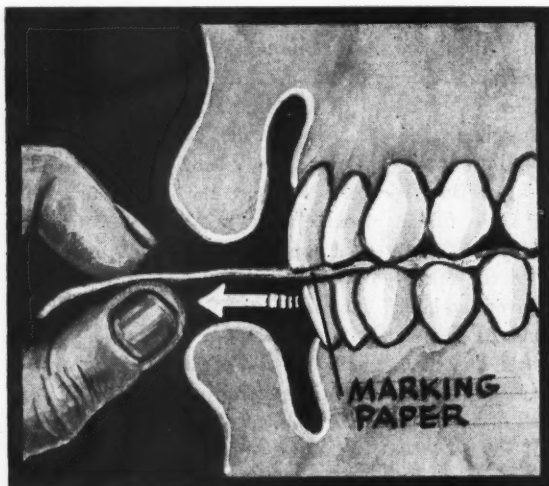
Clinical and Laboratory

A Saliva Ejector Tip

Gordon W. Spinks, D.D.S., Hamilton, Ontario, Canada

1. Punch holes in a piece of clear rubber tubing and fasten the rubber tubing to the metal saliva ejector. Cut the end of the tubing at a 30-degree angle. This safe tip will be more comfortable to the patient than a metal one.

2

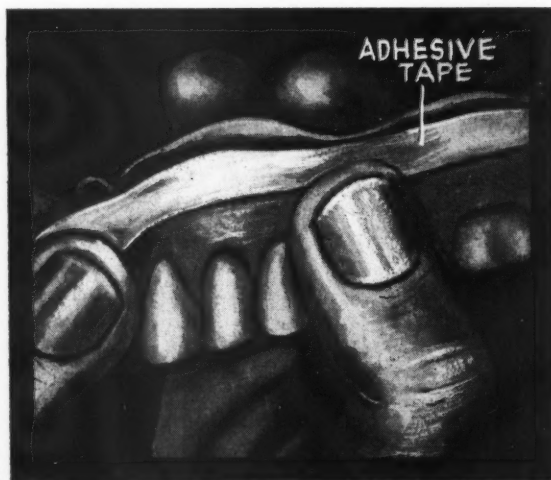


An Improved Method for Using Marking Paper

Donald G. Thomey, D.D.S., Ventura, California

2. Instead of having the patient grind his teeth on marking paper and possibly chip a soft alloy restoration, have him close lightly on the paper. The operator can then *pull* the paper free, marking the high spots without worry that lateral jaw movement will disturb the restoration.

3



Relining Dentures with Self-curing Acrylic

Charles B. Branson, D.D.S., Lincoln, Nebraska

3. Cover the labial and buccal sides of the denture with adhesive tape to prevent the acrylic from attaching to the sides of the denture. Dry the ridges and the palatal area, and apply a coating of mineral oil to prevent burning the tissues before introducing the self-curing acrylic for the reline.

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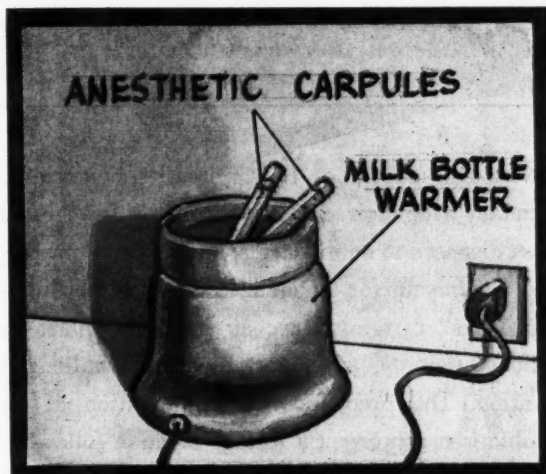
You do not have to write an article. Furnish us with rough drawings or sketches, from which we will make suitable illustrations; write a brief description of the

SUGGESTIONS . . .

Warming Anesthetic Solutions

I. A. Del Papa, D.D.S., Galveston, Texas

4. By using a baby bottle warmer, anesthetic tubes may be kept warm. Solutions introduced into the tissue at body temperature are less likely to produce shock and pain.

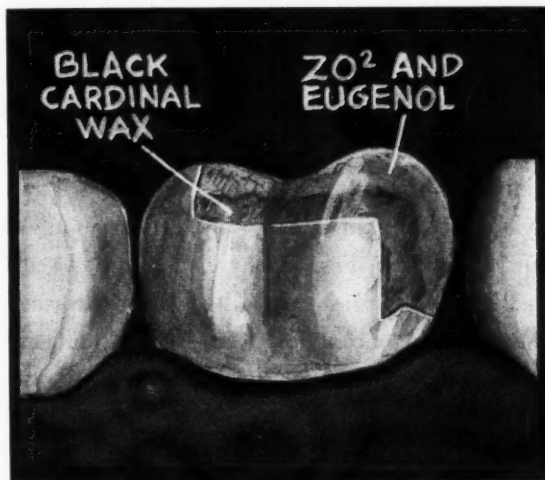


4

A Temporary Stopping

Erwin C. Lubit, D.D.S., Brooklyn, New York

5. After a cavity has been prepared for an inlay, coat the cavity walls with eugenol, then place black carding wax over the cavity surfaces and cover the wax with a thick mixture of zinc oxide-eugenol. This procedure prevents the tooth from becoming sensitive and permits easy removal of the stopping when the patient returns.

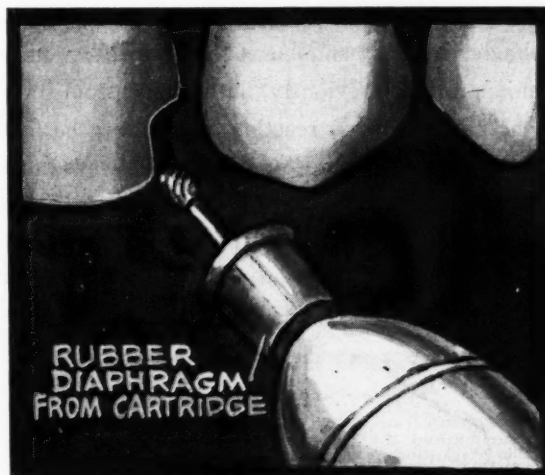


5

A Handpiece Protector

H. J. Turkheim, D.M.D., London, England

6. When preparing cavities in the upper jaw, to avoid cooling water running into the handpiece, use a protective rubber diaphragm from an anesthetic tube. This will fit snugly over the free end of the handpiece.



6

technique involved; and jot down the advantages of the technique. This shouldn't take ten minutes of your time. Turn to page 326 for a convenient form to use.

Send your ideas to Clinical and Laboratory Suggestions Editor, DENTAL DIGEST, 708 Church Street, Evanston, Illinois.

The EDITOR'S Page

SINCE THE advent of the antibiotics dentists, in common with their medical confreres, have often been disposed to administer penicillin, aureomycin, and terramycin for trivial infections. These "wonder drugs" certainly have an important place in rational therapy, an important and unchallenged position. The preoperative administration of an antibiotic may prevent a serious reaction following tooth removal. The postoperative use of an antibiotic is a sound procedure to prevent such serious sequelae as acute bacterial endocarditis.

That there may be and are serious reactions from antibiotics is generally known. Often the reaction is conspicuously worse than the condition for which the antibiotic was given. One particular type of reaction to penicillin has been carefully studied by Feinberg, Feinberg, and Moran.¹ This is the anaphylactic type characterized by urticaria, angio-neurotic edema, asthma, emphysema, labored breathing, shock with profound fall of blood pressure, cyanosis, and unconsciousness. A fatal outcome from such a reaction is, fortunately, relatively rare.

Administration by hypodermic injection produces the larger number of reactions, but penicillin administered by mouth, by aerosol, or by instillation may initiate the anaphylactic type of reaction. Any type of penicillin may be responsible.

In general, the majority of reactors are persons "who have had a number of injections or other administrations previously, but judging from some of the records such a reaction may follow the first time the drug is administered. Almost always there is an interval of several weeks or longer between the non-reacting and the reacting dose."

Before the dentist administers or prescribes penicillin he should ask the patient if he has a history of allergic disease such as hay fever or asthma.

If such a history is given, the dentist should refer the patient to an allergist for a skin test. It is believed "that a skin test will be positive in all those persons who react anaphylactically to penicillin."

In taking the history of the patient it is also advisable to ask him when, how much, and for what condition penicillin was previously administered. This information is important because a considerable group in the population has become sensitized to penicillin as a result of repeated uses of this antibiotic in the treatment of a multitude of conditions. Dentists, but more often physicians, are guilty of "shot gun" prescribing in using penicillin for a whole galaxy of conditions of noninfectious origin and for infectious conditions that are produced by organisms that are not amenable to the antibiotic. It is frightening to consider the thousands of patients who each day in this country bare their buttocks for an injection of penicillin where no history is taken, no questions are asked, no provisions for treatment are available.

It would be an unwise dentist who undertook the treatment of a penicillin reaction except in the most grave kind of emergency. For the sake of his background information, however, the dentist should be familiar with the principles of treatment: "At the first sign of an immediate reaction, 0.5 to one cc. of epinephrine in a 1:1000 dilution should be given intravenously. This should be followed in two or three minutes by a similar dose if no improvement is seen. As soon as the epinephrine has been administered, it would be wise to give aminophylline (3.75 grains or 0.25 grams in 10 cc.) intravenously. If cyanosis is present, oxygen should be administered. If shock continues, plasma should be administered intravenously if facilities are at hand."

The possibility of a penicillin reaction is ever present and should not be considered too lightly. Mild reactions are extremely common and severe ones appear to be increasing in frequency.

¹Feinberg, Samuel M.; Feinberg, Alan R.; and Moran, Clifford F.: Penicillin Anaphylaxis, Nonfatal and Fatal Reactions, JAMA 152:114-119 (May 9) 1953.

APICAL REGION

and Pulpless Teeth

GUIDO FISCHER, Berg-Starnberg, Germany

Biologic Methods in Therapy

Every case of pulpal necrosis is the result of organic infection. This is partly related to the problem of caries, which is the principal cause of destruction of the pulp, and partly to the constitutional conditions of the patient and must, therefore, be different in each case. The term constitutional condition is used in its broadest sense to mean environment, conditions of existence, nutrition, and psychologic influences.

Urge for Self-Preservation—Pathogenic bacteria are the most formidable enemies of the living body and of the teeth in particular. The urge for self-preservation in the organism, however, governs the autonomic control through the latter's neurologic and hormonal mechanism which acts as a constant force toward the repair of injuries that the organism has undergone.

Reparative Mechanism—Interference with the reparative mechanism, which is the strongest impulse of the living body, not the disease, causes sickness. Each injury lessens the power of defense so that in case of infection the dissemination of toxic fluid advances more or less without restraint.

Diseases of Dentition Discovered Too Late—Caries and periodontosis follow a long course of development, originating in the mysterious recesses of heredity. Clinically they are first recognizable when the main protective organ of the tooth, the enamel, or in the case of periodontosis, the periodontal membrane, is infected. The subjective symptoms are deferred even longer, to a time when all hope for preservation of the intact pulp or periodontal membrane has disappeared.

The Course of Oral Focal Infec-

tion—In the deceptive and unperceived course of oral focal infection there is only the hope of avoiding necrosis of the pulp through (1) preventive measures, (2) root canal treatment performed according to the newer aseptic methods, or (3) radical surgical therapy.

Resistance the Deciding Factor

In every case of dental caries there is introduced a lesion, the later stages of which are pulpitis and necrosis. The body, however, always reacts according to its individual powers of defense. It is resistance which determines whether pulpitis develops into necrosis slowly or rapidly.

Defensive Mechanisms—(1) Secondary dentin, (2) a tendency to abscess formation, or (3) uninhibited phlegmonous radiation into the periapical tissues, represent an expression of the powers of resistance in a patient. Even granulomata and cysts following necrosis are evidence of a resistant organism which has been able to take defensive measures through the periodontal membrane.

The Non-resistant Patient—Not having the means to form the membrane to wall up the focus in infection, in the non-resistant patient the purulent process progresses unhindered in the form of diffuse rarefaction about the apical foramen. Thus the elements are provided for a focal infection to proceed to general infection.

Elements Which Evoke Illness

In the apical region the following elements must be present to evoke a serious illness in the patient:

1. Decay of organic substance following destruction of the pulp and of the odontoblasts, in particular.

2. Invasion by pathogenic organisms or more or less high virulence in the complicated canalicular network of the apical dentin.

Both of these processes produce matter which is highly toxic to the body as a whole.

Apex the Focus of Infection—The present researches indicate that the root apex is the actual focus in focal infection, not the granulomata or cysts which are defensive organs set up about the infected root as evidence of a high degree of resistance in the patient.

Granuloma Hinders Outflow of Toxins—Whenever granulomata may be shown as related to focal infection, they are not hermetically sealed but are more or less permeable and open. *Thus the toxins are able to filter through or to become absorbed by the capillaries of their walls. In every case the toxins must reach the central nervous system in order to cause disease.*

Focal Infection an Insidious Disease

The nucleus of the disturbances established by focal infection, first recognizable when the process has advanced too far and involved other organs, is to be found in the necrotized pulp canal which, following the death of the pulp, assumes the role of a reservoir of toxins. These gain access to the periodontal membrane through the apical foramen and accessory foramina.

Proliferation of Epithelium—In the apical foramen the healthy organism erects a filtering station which is of the utmost biologic significance in the interception of toxins. The pulp possesses no epithelium but it may be preserved through restoration of the defect in the dentin. It is noteworthy that the presence of epithelial tissue in the periodontal region is subject to great variations.

Epithelial Tissue May be Absent—In the event of severe dyscrasias or infections (diseases such as tuberculosis) it may be absent, so that cyst formation is not always possible. The presence of epithelial tissues and the resistance of the patient appear to be in strict relation to each other.

Defect Corrected by Epithelization
—The following is noted:

1. The defect set up by the death of the pulp can be corrected by epithelization just as in the healing of any wound; a form of organization occurs.

2. The toxins can be intercepted and rendered harmless at the epithelial surface.

Biochemic and bioelectric phenomena take place at the apical foramen, the exact mechanics of which can only be guessed at as they are not yet comprehended.

Lessened Resistance—With lessened resistance, healing at the apical foramen does not take place. The lesion progresses to abscess formation which threatens the life of the patient. Serious consequences with occasionally fatal results are observed when there is prolonged diffusion of toxins into an already weakened body.

Course of Infection Parallels that of Tuberculosis—Two forms of tuberculosis are known:

1. The productive form, an expression of heightened resistance with encapsulation of the tuberculous lesion, equivalent to the granuloma or cyst of a tooth.

2. The exudative form, a sign of diminished resistance with a dangerous course, equivalent to the diffuse area at the root apex with focal infection.

Periodontosis can Lead to Focal

Infection—In periodontosis, too, the necessary conditions for focal infection, a tendency toward diffuse spread of the infection and its toxins, are fulfilled:

1. Constitutional breakdown.
2. Heightened virulence of organisms.
3. Nonresistant periodontal membrane which favors diffuse rarefaction.
4. Lack of encapsulation.

Intertoxication of the Central Nervous System

A focal infection may be looked upon as a typical example of the intertoxication of the central nervous system, described by Ricker-Speransky. Sensitization of the all-important control center of the nervous apparatus results in the typical picture of illness which follows the breakdown of one or another organ.

The allergenic processes originating within the root are also largely dependent upon the general reactivity of the patient and are, therefore, constitutionally conditioned.

Focal Cases of Rheumatism—Klinge states that focal infection in rheumatism "is to be regarded as an altered expression of the immunologic reaction to allergy on the part of an organism long inundated with antigens."

Focal Infection From an Inactive Focus—Another authority states that focal infection can develop at any

time from an inactive focus should the host be weakened by any altered circumstance. A dormant focus of infection is frequently seen to become highly active after any severe infectious disease.

Possibilities for Recovery

1. If it is correct that a systemic defense effects the healing of a wound, there can be no doubt that only the normal resistant person is capable of recovery from necrosis of the dental pulp. The same is true for periodontosis.

2. Recovery is not possible should the resistance be badly weakened as in tuberculosis, diabetes, or circulatory insufficiency.

3. A fixed method of therapy is impossible because of the countless variations between the extremes. A common method can never be successful. The patient has been lost sight of as a whole because of too narrow concentration of local measures.

Conclusion

At a time when treatment is directed to the patient as a whole and root canal therapy adapted to the actual condition of the patient, a successful method of therapy will be found. That this procedure is feasible has been demonstrated.

Adapted from *New York State Dental Journal* 18:123-128 (March) 1952.

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Effects of Tobacco Smoking

Nonsmokers live longer than smokers and the survival is shorter for heavy than for moderate smokers. Smokers are more apt to have colds, dyspnea, and dyspepsia than nonsmokers.

Nicotine, the only important alkaloid in tobacco leaves, stimulates, then paralyzes the sympathetic nerve endings. Other products of cigaret smoke are hydrocyanic acid, ammonia, carbon monoxide, pyridines, aldehydes, and tars. Enough carbon monoxide is absorbed from 20 cigaretts daily to maintain 5 per cent of hemoglobin in carboxy form.

A cigaret increases blood pressure an average of 10 millimeters diastolic and 15 millimeters systolic and the pulse about 8 beats a minute. Decreased limb volume and lowered skin temperatures while smoking show arteriolar narrowing.

Such phenomena will aggravate cardiovascular disease. Among patients with angina pectoris, the number of smokers does not differ significantly from the number of nonsmokers. However, the incidence of angina pectoris is slightly higher for heavy than for light smokers.

Smoking does not cause thromboangiitis obliterans nor other peripheral vascular disease. However, tobacco will produce vasoconstriction, dangerous in obliterating vascular disease. Therefore, patients with that disease should not smoke. Gangrene or reduced skin vitality with intermittent claudication contraindicates smoking.

Smoking of cigarettes reduces vital capacity and chest expansion. Irritation from heavy smoking leads to chronic pharyngitis and will aggravate chronic bronchitis in the predisposed. Statistical investigations indicate that cigaret smoking may cause bronchial carcinoma. Some studies conclude that carcinoma is 50 times more likely to develop in persons over 45 years who have smoked 25 or more cigarettes daily than in nonsmokers.

MEDICINE

and the Biologic Sciences



Cancer of the lip is more common among pipe and cigar smokers than in the general population. Decreased gastric motility with reduced volume and acidity of secretion may occur with cigaret smoking, but usually not when smoking is pleasurable. Smoking apparently does not affect genesis or healing of peptic ulcers.

Amounts of nicotine in the nursing mother's milk increase with the number of cigarettes smoked, reaching 0.5 milligrams per liter for heavy smokers. Infants fed such milk seem to thrive normally, even though receiving about 0.2 milligrams of nicotine daily.

Scott, Ronald Bodley: *Effects of Tobacco Smoking*, Brit. M. J. 4760: 1:671-675 (May) 1952.



Antibiotics— Effective Use

Most practitioners probably employ dosages of antibiotics which are too small. Their action is bacteriostatic and not bactericidal. Thus, for recovery from an infection, the bodily defense of the host must take

part. If treatment is stopped too soon, recrudescence of the illness occurs.

It is important to decide first whether the intended dosage schedule will provide a bacteriostatic or bactericidal concentration at the site of infection. The location of the infection is an important consideration. High concentrations of an antibiotic are required in the blood if the infection is in an area of poor blood supply. In walled-off processes, such as abscesses, penetration of the antibiotic into the affected area is much impeded. To ensure a killing effect the tissue concentration of the agent must be several times higher than is needed for bacteriostatic action.

Susceptibility of the organisms to antibiotics varies widely. Gonococcus is easily killed by penicillin, whereas some strains of beta hemolytic streptococci or pneumococci require 2 to 5 times as much to secure bactericidal effects.

Bacteriostasis is often all that is needed because surface phagocytosis in the lungs, lymph nodes, and subcutaneous tissues is important in ridding the body of invading microorganisms. Another consideration is the so-called natural resistance of the pathogen to the antibiotic.

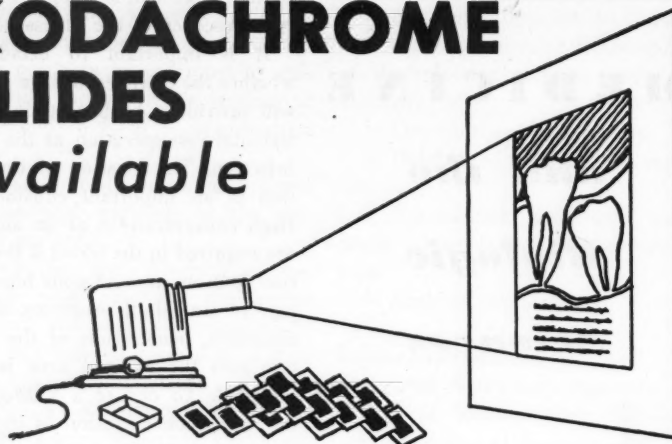
The staphylococci were originally extremely susceptible to penicillin. However, many strains have lately developed a resistant and elaborate penicillinase, a substance that antagonizes the antibacterial effects of penicillin. No so-called natural antagonist resembling penicillinase seems to exist for streptomycin, aureomycin, chloramphenicol, or terramycin.

Organisms may not only become resistant to streptomycin but may require the antibiotic as a growth factor. Streptomycin is probably of practical value now only in the treatment of tuberculosis.

Resistance to aureomycin, chloramphenicol, and terramycin develops slowly and in a steplike pattern similar to the pattern shown by the sulfonamides and penicillin.

Long, Perrin H.: *Effective Use of Antibiotics*, New York State J. Med. 52:1637-1639 (May) 1952.

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Poisoning in Children

Among children from one to four years of age, poisoning continues to take its annual toll. This is the time when locomotion and curiosity far outweigh knowledge and judgment. The "Big Six" in pediatric poisoning are: (1) barbiturates, (2) kerosene, (3) salicylates, (4) arsenic, (5) strychnine, and (6) lye.

Poisoning must be considered in any unexplained illness, particularly that of an acute nature. The signs and symptoms may be suggestive but are not diagnostic. In dealing with poisoning the general principles are (1) identification of the poison, (2) prevention of further absorption, (3) use of physiologic antidotes or treatment of the hazardous manifestations, and (4) the provision of fluids, calories, electrolytes, and vitamins, to cover not only normal daily needs but

also those demands increased by the metabolism or elimination of the poison.

Absorption of the poison may be minimized by the following procedures: (1) emesis, (2) measures to delay gastric emptying, (3) gastric aspiration and lavage, (4) the introduction of a specific or general chemical antidote, and (5) the use of cathartics. Emetics, though time honored, are too apt to cause aspiration of vomitus in this age group. Emetics are contraindicated in coma and for kerosene poisoning.

Many poisons induce vomiting by local irritant action. Where this does occur it might be better to have the child drink milk. Milk is known to prolong the gastric emptying time, thus delaying the absorption of alkaloids. Milk aids in precipitating metallic poisons. Its calcium content will convert sodium fluoride to non-toxic calcium fluoride. In addition, with the possible exception of furthering phosphorus absorption, whole milk lacks the dangers inherent in many measures recommended.

Gastric aspiration and lavage may be life saving when properly performed. As frequently done, however, gastric lavage is more hazardous than helpful. It engenders a false sense of accomplishment. The usual lavage hastens the passage of gastric contents. It increases the likelihood of aspiration into the lungs—most likely to occur in toddlers and comatose subjects. Finally, lavage may induce fatal seizures in convulsant poisoning.

Shock may complicate many poisonings. It should be anticipated in phosphorus, mercury, bichloride, phenol, arsenic, and severe barbiturate intoxication. The treatment is the same as in the adult, but the amounts per kilogram of body weight are greater. When coma is present the major problem is to maintain adequate respiratory exchange and an effective circulation.

Alway, Robert H.: "Accidental" Ingestion of Poisons in Childhood, Postgrad. Med. 2:239-243 (March) 1952.



Cerebral Palsy— Etiology

A number of organizations interested in children have been bringing more and more attention to cerebral palsy. There are about 50,000 children in the United States and 10,000 in Britain afflicted with the condition. It is second only to poliomyelitis as a cause of crippling children.

The abnormality is usually defined as a condition characterized by paralysis, weakness, or incoordination or any other aberration of the motor center of the brain. Recent findings show that emotional and sensory factors must also be considered.

The etiology can be classified according to the time element: (1) prenatal, (2) paranatal, and (3) postnatal.

Under prenatal, heredity is probably the most important. Rh incompatibility with erythroblastosis fetalis and cerebral defects resulting from kernicterus is common. Virus infection of the mothers during the third month can cause fetal encephalitis, but whether cerebral palsy is a common result is not known.

Paranatal lesions are largely due to asphyxia of the infant. "Brain hemorrhage" is much talked about but rarely seen. The low oxygen tension that causes the damage may be due to excessive anesthesia and over-sedation added to the mechanical risks of delivery. Prematurity adds greatly to the risks of asphyxia.

Postnatally the cerebral damage may be due to encephalitis of various sorts, especially measles encephalitis. The list here includes all the cerebral diseases of childhood and is limited only by a definition of how late in development one believes cerebral palsy may appear.

In each population of 100,000, seven children are born each year with cerebral palsy. One of these dies in infancy and two are definitely feeble-minded so that they cannot be treated constructively. The remaining four will have relatively normal mental capacities and make up the case load for treatment. Of these, the

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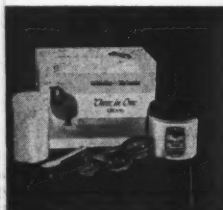
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symptoms of one will probably be so mild as to need little if any treatment. Two will be capable of great improvement and one will have so much motor difficulty as to be relatively helpless.

Cobb, Stanley: Review of Neuropsychiatry for 1951, Arch. Int. Med. 90:410-421 (September) 1952.



Mental Health and Music

The question of whether music helps or harms those who are mentally ill is best answered by physicians and personnel in charge of mentally ill patients. Physicians now realize that music serves as one of

the best known mediums of medication for the mind.

Music can be of various kinds and still achieve the same gratifying results; namely, that of quieting the patients, lessening depressed feelings, establishing self-confidence, and creating a sense of well-being. It provides an emotional outlet for repressed feelings and can change a dissatisfied and destructive mood into a satisfied and constructive mood.

When possible it is advisable to encourage a mentally ill patient to participate in some type of music, whether it be vocal, instrumental, or theoretic. This awakens past interests and gives the patient a feeling of achievement and accomplishment, thus removing fears, uncertainty, and confusion.

It has been observed that groups of mentally ill patients assembled in a dining room where soft music was being played showed signs of relaxation, self-control, and a quiet attitude which would have done credit to the decorum of a large hotel dining-room.

These studies and observations are helping the public to understand the medical benefits of music and its effects. These efforts are being rewarded by the large number of volunteers who offer their services and talent to the hospitals for the mentally ill. The volunteers play and sing for the patients as well as organize them into choral, instrumental, and music study groups.

Podolsky, E.: Music and Mental Health, Mil. Surgeon 110:420-424 (June) 1952.



Epilepsy

Even though epilepsy effects some 600,000 people in the United States it still is one of the least known and most misunderstood of diseases. Only within the past few years has significant progress in the treatment of the condition been reported.

Epilepsy has been more or less an orphan disease to which none of the medical specialties gave proper attention. The problem for the epileptic

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CLINICAL AND LABORATORY SUGGESTIONS

(See pages 316 and 317)

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Sketch:

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has been complicated by the attitude of the public. In ancient times a person with seizures was thought to be possessed of demons. The impression still persists in the public mind that epilepsy is associated with mental deficiency or illness.

The concept of the "epileptic personality" no longer has general acceptance. The epileptic person cannot, however, escape the impact of public reaction to his illness. He is often denied admittance to schools; the family may feel disgraced; employers are reluctant to hire him; he may find himself an outcast in his social contacts like the neurotic or post-psychotic. The occasional loss of sphincter control during a seizure is a source of personal embarrassment. It would take an extremely stable person to escape these pressures on his personality.

It is not known what causes seizures. No one can predict when the seizures will occur. The physician is able to determine the nature of the seizure from the patient's history and medical examinations. It has been found that 87 per cent of epileptic subjects have an irregular brain wave pattern as determined by the electroencephalograph. Only 15 per cent of non-epileptics show a similar pattern.

Seizures may be one or a combination of four general types: (1) Grand mal (big illness) is the only one that may be called a convulsion and is the one most familiar to the public. There is loss of consciousness from one to three minutes, rarely longer. Afterward there may be a period of drowsiness and confusion for a half-hour or more. There may be tongue-biting and loss of sphincter control.

(2) Petit mal is a short seizure—10 to 30 seconds. It is a temporary blackout, in which the patient loses contact with his surroundings. Unlike grand mal, he does not fall, and soon resumes what he was doing prior to the attack. These can occur as often as 100 times a day.

(3) The psychomotor attack is the result of irritative injury to the anterior portion of the temporal lobe of the brain. It occurs in 2 per cent

of the cases. These attacks are characterized by trance-like behavior, as though the patient were acting out a dream, and of which he has no recollection afterwards. Occasionally there is bizarre behavior.

(4) The Jacksonian seizure is a local attack. It can be limited to a finger or twitching of the mouth. Usually it is confined to one part of the body.

The medical treatment of seizures is a process in which various anti-convulsants are tried out on the patient, singly or in combination. The problem is to determine which medication procedure will reduce or eliminate the seizures without toxic effect on the patient.

Hakenen, C. Arthur: *The Medical and Case Work Approach to Epilepsy*, J. Michigan M. Soc. 51:1021-1023 (August) 1952.

Implant Dentures May Be Vindicated

MANY HAVE looked askance at implant dentures in the firm belief that they could never make a really permanent restoration. As we all know, the metal casting is placed in position directly on the entire surgically exposed alveolar ridge from which four metal posts arise for the attachment of the denture. The Achilles heel of implant dentures has always been considered to be the gingival tissue seal which later forms around these posts. As it seemed inconceivable that the epithelium could attach itself to metal, the conclusion appeared obvious that infection must ultimately penetrate along these posts into the underlying connective tissue and bone, thus causing failure of the restoration. The question is: Does epithelium have the property of sealing itself to metal?

In 1935, Bodecker and Lefkowitz reported observations showing that a new epithelial attachment was formed on replanted teeth of dogs, some even extending on to enamel. These observations are now supplemented and confirmed by the far more extensive work of E. O. Butscher, reported at

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from an
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- "Please send me two copies of Visual Education in Dentistry. I am a subscriber to Dental Digest and received the booklet but some patient has already walked off with it." —C.D.S., Pa.
- "Would you please send me your fine illustrated booklet, Visual Education in Dentistry? One of my colleagues showed me his book and it looks fine, and should be a wonderful aid in case presentations." —T.S.H., Okla.

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the March meeting of the International Association for Dental Research in Philadelphia.

They show that in the case of monkeys the epithelial reattachment occurred even though one tooth was immersed in 10 per cent formalin before replantation, and that the histologic structure of the reattachment appeared normal.

It would appear that further investigations will have to be made regarding the character of the epithelial seal. By what mechanism does epithelium become attached? One pos-

sible answer is that a secretion of the epithelial cells glues them to any clean, stationary substance.

Judging by the reports of dentists who have observed the normal condition of the gingivae surrounding the posts of implant dentures, it seems apparent that a bacterially impermeable seal is truly formed. If and when this is confirmed, important objection against implant dentures may be removed.

From Editorials, *New York State Dental Journal* 19:250 (May) 1953.

Contra- Angles



Wisdom of India

A dental colleague in India, K. M. Choksey, has sent me an autographed copy of his book, *DENTISTRY IN ANCIENT INDIA*. To us moderns who think that we know almost everything it will come as a jolt to know that 4000 years before Christ the sages of India were writing intelligently on dental subjects. The Vedas, the sacred literature of the Hindus, were written in poetic style. In many of these lovely poems references are made to dental and medical subjects.

The priestly class, the Brahmins, were the outstanding physicians. They lived in pleasant cottages in the country surrounded by their medicinal plants and herbs that numbered more than 1000 varieties. One of these medicinals has been rediscovered and is being offered to the medical world in the year 1953 as a new therapy. It is *Rauwolfia Serpentina*, an alkaloid extract of an Indian root used in the treatment of hypertension. Current medical journals advertise the product.

These Vedic physicians, like the later Greek philosophers, taught in the pleasant groves and in the open air, leisurely, and imparted a profound philosophy of life along with practical knowledge. In their code of ethics they antedated Hippocrates by hundreds of years. Here is an example of a moral code from Ayurveda, the science of life:

"The doctor was not supposed to praise his own learning or dexterity. When examining a patient he must be cool and calm. He should always console a patient even if the prognosis is bad, his manners should be decent and polite with the patient's relatives. He had to conform to a high standard of morality. He should be careful about his dress and ap-

pearance. He should not laugh with a woman, or go alone to examine a female patient. He was strictly forbidden to accept any present from a woman without the sanction and knowledge of her husband. In a patient's residence he should talk politely. He should not look at women in patient's house or exchange talks with her in secrecy. He must avoid her if she was found making any signs or overtures of love. Consultations with doctors should be carried on in a friendly professional manner. In spite of heated discussions courtesy should not be overruled. The doctor must be convinced with scien-

tific arguments and he must be impressed by quoting authoritative verses from the standard books. He must be exposed by detecting his mistakes. If he refused giving up his point, he should be challenged with very difficult and complicated questions till he has changed his mind. He should not behave in an insolent manner. He should try to win over him with soft words and charming manners befitting a perfect gentleman."

Of particular dental interest is the Vedic proverb: "He who does not masticate well is an enemy of his own life." In our present day searching



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for infection as the basis of all dental ills we have softened the emphasis on the physiologic value of mastication that is so well expressed in the proverb. The material in Doctor Choksey's book on nutrition, on smoking, on mouth hygiene, are priceless bits of ancient wisdom quaintly written:

On eating: "One must eat in measure and the measure of food is determined by the strength of one's gastric fire. That should be known as the proper measure of food which when taken is digested in due time without impairing one's health . . . The daily diet should not only help

to maintain life but serve as a prophylactic against disease in the future . . . From the point of quantity it is laid down that heavy articles should be taken in one-third or one-half measures of the full meal while even light articles should not be taken in excess and should accord with the strength of the gastric fire. The measured diet not only does not impair one's health but positively promotes one's strength, complexion, health, and life."

On smoking: "Know it to be a successful smoke when the chest, throat, and head feel light and the phlegm is liquified. Know it to be an

unsuccessful smoke if the voice is not clarified and the throat is filled with phlegm and the head feels stiffened. When the palate, the head, and the throat feel parched and heated all over, and the person feels thirsty or stupefied and bleeds profusely, or his head feels extremely whirling or he becomes unconscious, or his sense organ feels agitated, it should be known that smoking has been done in excess."

On mouth hygiene: "It is an old and general belief that the Indians have beautiful and strong teeth. The laws of Manu enforced a strict code of hygiene which includes compulsory ablution. The Hindus have a high concept of hygiene. They will not take anything in the morning without cleaning their teeth and washing the mouth. There was a strict code of oral hygiene, which was based on religious sanction. The mouth being the gateway of the human body through which all the food and drink passed, it was kept scrupulously clean. Early in the morning, the brushing of the teeth was done with the twig of a tree, and this practice is transmitted to us from father to son from time immemorial. The twig is popularly known as 'Datana' or the Indian tooth brush. It was either of a babool, (astringent), neem (bitter), or banyan (sweet) tree. The twig is about eight inches in length, and in circumference equal to that of the little finger. A green twig is crushed and chewed at the proximal end till it becomes soft like a painting brush, so that it may not cause any injury to the gums. All the surfaces of the teeth were cleaned up and down slowly and gradually for about twenty to thirty minutes. Then the 'Datana' (twig) is split up from the chewed end and is divided in two separate parts. One then, half broken and bent in an inverted V shape, is used as a tongue scraper. The chewing of the twig gives an exercise to the jaws and juice extracted from it tones up the gums. Charaka says 'The tooth twig should be used twice a day. Teeth cleaning dispels oral fetor and dysgenasia, removes the impurities of the tongue and the teeth and

the mouth, and promptly induces appetite. Twigs culled from Indian beech, Indian oleander Mudar, Arabian Jasmine Arjuna, Spinous Kino tree and such other trees are recommended for use in teeth cleaning. The tongue scraper should be without a sharp edge, curved and made of gold, silver, copper, tin or brass. The coating which accumulates at the root of the tongue and obstructs respiratory passages is the cause of fetor oris, therefore the tongue should be properly scraped. One desirous of cleanli-

ness, relish and fragrance of breath, should keep in the mouth nutmeg, musk mallow, betel nut, cloves, cubeb pepper, good betel leaves, camphor, and small cardamon. . . .

"The tooth powder that was used was made of burnt almond shells or ordinary wood charcoal in eight parts, and one part of Sindhava (rock salt). This powder was either taken on the 'Datana' or it was rubbed on teeth with the finger. In the common practice for massaging the gums, which is still current, purified

castor oil is used to which is added a small amount of powdered rocksalt and camphor. Then the mixture is boiled for a few minutes and cooled. This is used for massaging the gums. It has a stimulating effect on the gums and refreshes the mouth."

When we become too concerned in the present it is good discipline to turn to the writings of antiquity to learn that people since the beginning of recorded history have had problems much like our own and methods of meeting them. Our methods of facing up to our issues may be different from those of the ancients but ours are not always better methods. We may have more knowledge but less wisdom.

Chicken Feed

It appalls me to know that farm animals, particularly hogs and chickens, are being stimulated to quicker and more profitable growth by the use of antibiotics. *Fortune* proudly proclaims: "A billion farm animals annually consume about 100 tons of antibiotics which had been added to some 15 million tons of feed. When the full potential of animal feed supplementation with antibiotics is realized, it may well be worth 500 million dollars a year to the U.S. farm economy at a cost of about one-tenth of that figure." Note that nothing is mentioned in this statement concerning the well-being of the people who eat these products.

If "the mystery of antibiotic growth effect is a long way from solution" we may be tampering with nature in a disastrous fashion. If chickens and hogs are stimulated to excessive growth it may mean that their pituitary glands are being encouraged to hypertrophy. That kind of giantism is unnatural. What will happen to the human beings who eat the flesh of these unnatural monsters? Does it mean that some of the growth-stimulating factor will be passed along to human beings? And if it does, it may mean that in human beings the growths will take the form of malignancy, changes in the intima of blood vessels, and the piling up of excess tissue in vital organs and parts.

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Maybe we are getting a bit too smart for our own good and we will be destroyed as a nation, not by an external enemy but by physical degeneration brought about by our own technologies.

Recent History

My colleague and neighbor, I. A. Smothers, of Evanston, tells of a discovery he made a few years ago while on vacation in Michigan. Cut into the stonework on an old outdoor oven were these words attributed to Robert Burns:

THE SELKIRK GRACE

Some hae meat and canna eat
And some wad eat that want it;
But we hae meat and we can eat
And sae the Lord be thankit.

As my friend, Smothers, said: "This simple verse appealed to me strongly because the primary aim of the dental profession is to enable folks to say, 'and we can eat and say the Lord be thankit.'"

—E.J.R.

Focal Infection

(Continued from page 313)

able of producing disseminated disease. The following situations provide examples: (1) A cutaneous abscess may, if subjected to trauma, give rise to bacteremia, resulting in susceptible patients in acute bacterial endocarditis, osteomyelitis, suppurative arthritis, perirenal abscess, or a variety of other systemic manifestations. (2) Dental foci of infection have been observed to give rise to transitory bacteremia following mastication or massage of the gums, and extraction of teeth infected with *Streptococcus viridans* has resulted in the development of subacute bacterial endocarditis due to the same organism. (3) Bacteremia has also been detected following massage of an infected prostate, and there is no reason to believe that it may not occur as a result of the stress applied to infected tonsils or other compressible foci of infection during contraction of adjacent muscles. (4) Localized infections with *Corynebacterium diphtheriae*,

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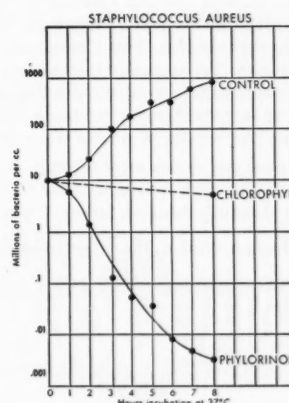
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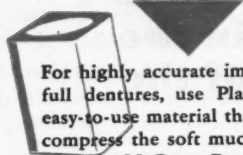
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ria, *Clostridium tetanus*, and hemolytic streptococci produce distant effects such as myocarditis, muscle rigidity or a scarlatiniform eruption by means of toxins liberated by the organisms. Similar but less dramatic effects are possible in focal infections due to other organisms liberating exotoxins. (5) Local infection of the throat with group A beta-hemolytic streptococci is sometimes followed in susceptible persons by acute rheumatic fever. This is presumably the result of sensitization of the connective tissues of the joints and heart to

the organisms disseminated from the focus or to the products of their interaction with the tissues of the host. Chemotherapeutic and antibiotic prophylaxis of respiratory infections has been demonstrated to reduce the incidence of rheumatic fever. These examples in conjunction with others lead to the conclusion that the etiological role of focal infection in some systemic diseases is no longer theory, but fact. Collateral evidence is supplied by the observation that relief of symptoms follows removal of foci in some patients with early disease.



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Causative Role Questioned—The fact that some foci participate in the production of some diseases does not justify the assumption that all foci produce disease or that all poorly understood diseases as rheumatoid arthritis has been neither proved nor disproved. While it is theoretically possible that this disease originates as an allergic reaction to bacteria or their products, direct proof is lacking. In any case it is well established that removal of foci in patients with advanced rheumatoid arthritis is not a curative procedure.

Problem of Treatment—It is apparent that focal infection cannot be ignored in the practice of medicine; on the other hand, the indiscriminate removal of all suspected or potential foci from a person without complaints is to be condemned. It has been suggested that in patients with diseases known to be due to focal infection the primary focus should be eradicated promptly, and that the secondary disease, if due to active infection, should be treated similarly. In early disease, eradication of foci may relieve symptoms; in advanced disease it should not be expected to do so, although it may lighten the load on the body's adaptive capacities. In patients with diseases probably not caused by focal infection any active foci present should still be removed if they appear to affect unfavorably the general health of the patient. It should be understood by both patient and physician that the removal will not influence the disease directly; but in healthy persons an active focus of infection should be treated, not only to eliminate the remote chance that it will produce trouble at a distant site, but to remove an abnormality.

Adapted from Editorials and Comments, *Journal of the American Medical Association* 150:490-491 (Oct. 4) 1952.

Spoon Dentures

(Continued from page 306)

speaking, the flat palate must have a large spoon since more reliance has to be placed upon cohesion and ad-



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hesion. The narrow, high palate will only need a small spoon; it is in these cases that the maximum mechanical retention is found.

Fitting the Spoon—Having decided roughly how large the spoon is to be, the exact outline must be marked on the model with a pencil and a food line cut with a sharp point. The denture must be processed accurately to this determined line so that the spoon fits closely to the palate and exerts a slight pressure at the periphery. The margins of the spoon should pass over as few rugae as possible and should be kept at least 6 millimeters away from the gingival margins of the bicusps to avoid hypertrophy of the gum.

Removing Undercuts—The acrylic must be carefully removed from the small undercuts which are invariably present at the gingival margins between the standing teeth to allow the insertion of the denture while still maintaining the maximum frictional grip.

In the case of the ordinary partial denture fitting closely around the standing teeth, there is usually more than one undercut to be removed. This is best done by surveying the model and blanking out the unwanted areas with plaster before the denture is processed.

Advice to Patients

The following instructions are directed specifically to wearers of spoon dentures:

1. It is extremely important that the denture be removed at night because of the danger of aspiration during sleep. In addition, the frictional grip will be greater during the day if it is not worn at night.
2. The denture should be removed before violent exercise is taken because of the likelihood of dislodgement or aspiration. The patient must be warned that the denture is easily lost while swimming or vomiting.

Conclusion

One week will suffice to determine whether it was wise or ill advised to attempt a spoon denture. If the lat-

(Continued on page 336)

In your ORAL HYGIENE this month

Is Dentistry



a Luxury?

That is a fair question, posed—and answered—by Doctor Jean Sayegh who has practiced dentistry both in this country and abroad.

Doctor Sayegh suggests that the dental profession find some means of directing educational effort toward the great mass of American people who can find money to pay for dishwashers but not dentures, and who think a vacation trip is much more important than a trip to the dentist.

★ ★ ★

"Why Can't You Collect Your Own Bills?" — Perhaps you've wondered why you should employ a collection agency to do what you could do yourself. "There's no secret about collecting accounts," you may say. That is true, but do you have the time to spend or the energy to expend in collecting bills? The answer to the question seems to be, "You *can* collect your own bills, but you will probably find it more economical in the end to let a collection agency do it for you."

★ ★ ★

Dogs are the after-hours interest of Doctor R. M. Weber and his wife—who have raised more than two hundred German Shepherds. Some of these dogs have become members of the K-9 Corps of the Army (one completing 149 missions and one capturing an enemy Major and two men) and others have become trained to be companions and guides for the blind. Speaking of his dogs, Doctor Weber

says, "You get so you like them better than a lot of people."

★ ★ ★

"Give Your Floors a New Face!" advises Stuart Covington, author of an article explaining the advantages of various types of floor coverings. If you are contemplating any office rearrangement or improvement, you'll want this floor data for reference. If you already have good floor covering, perhaps the author's directions for its care will be of value.

★ ★ ★

"How Will You Leave What You Leave?" Doctor J. C. Almy Harding tells of a dentist who, in trying to put his estate in good shape succeeded only in complicating his affairs most unfortunately. He suggests ways to guard against many of the errors this dentist—and others—have made.

★ ★ ★

Patience and patients—you can't afford to lose either if you are to keep your practice thriving. Best way to guard against losing the one—and then probably the other—is to really *like* your patients. This isn't easy in all cases, but you can fortify yourself to some degree against the emotion of impatience. Many dentists will find that the six rules listed in the article help them to gain the state of mind in which "Liking Patients Is Easy."

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